OCTOBER 1958
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NCES

# Contractors and Engineers

magazine of modern construction

Canal excavation *Page 16*

This section starts on page 28.

# Athey

## PW20s-DW20s

# Speed

## PRODUCTION

**SPEEDY DUMPS**

### on the largest earth dam east of the Mississippi

Nello L. Teer Co., Durham, N.C., has the earthmoving contract on the multi-million yard Bear Creek Dam in Pennsylvania. A fleet of Athey PW20 Bottom Dumps are on the job – moving a total of 6000 cu. yd. of rock and clay daily over a 7500′ haul. Completion is scheduled for 1960.

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Contractors and Engineers
magazine of modern construction

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Editorial

# Forewarnings—nature and man

A crispness in the air, World Series headlines, and a few beguiling Indian summer days should be a forewarning that winter is just around the corner. The change to the colder season brings a general stepping up of construction activity in order to complete as much work on a project as possible before inclement weather closes in. This advent of winter should also develop a realization that ice, snow, and cold need not necessarily put a halt to construction activity. By careful planning and scheduling, and by acquiring the needed winter equipment, a contractor may continue operations despite the cold weather.

Now is the time, also, for state and county highway departments, and toll-road maintenance crews, to assess their needs for new plowing, sanding, and trucking equipment, and to put what they have into first-class operating condition. It is easy to forget the past, but only a few months ago, on February 15 of this year, 50 inches of snow fell in 24 hours on northwestern Indiana. Both road and rail traffic were tied up and delayed for days. And near the end of last March, with spring just around the corner, southeastern Pennsylvania got one of the heaviest snowfalls in years. Cars and trucks were abandoned, and highways were blocked for miles in all directions. It is never too early, therefore, to begin planning against any emergencies that the weather may bring.

Grimmer, and more unpredictable than the weather, are the tempests unleashed by men in their revolts against government. U. S. construction men came into personal contact with this danger on two recent occasions. This past summer, Cuban rebels kidnapped American engineers and held them captive for several days in some fanatic scheme to gain recognition for their revolt. The other and tragic occurrence took place in Baghdad on July 14, when Robert Alcock and George S. Colley were wantonly slain by Iraqi revolutionists. Alcock was chief engineer of Industrial Engineers, Inc., and Colley was senior vice president of Bechtel Corp., both well known American companies which work extensively abroad.

Their bodies have never been recovered, nor have U. S. authorities been able to obtain from the new Iraqi government, which we recognized immediately after the successful revolt, any information about their murders. An investigation of these brutal and senseless killings of American citizens should be vigorously pressed, and this government should not rest until the slayers have been apprehended and brought to justice. The power of the U. S. government should ever be strongly in back of American engineers and technicians who are given passports to enter foreign countries for the peaceful pursuit of their business. Whatever claims are filed on behalf of the families of these deceased construction experts should be backed with the full power of our government.


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An Allis-Chalmers 160 scraper excavates a canal while a 200 scraper picks up stockpiled excavation for grading the Cape Coral development near Fort Myers, Fla. Both rigs are push-loaded by HD-16's.
*Page 16*


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Wood foundation piling is driven by a Manitowoc 3000, center, with Vulcan hammer to support a new sewage treatment plant at Yonkers, N. Y., being constructed for the Westchester County Department of Public Works. The cutoff wall, of L. B. Foster steel sheet piling, blocks infiltration of water from the Hudson River and keeps work in the dry.

# Sheet-pile cutoff wall driven to keep foundation work in dry for new sewage treatment plant

Foundation work on a Yonkers, N. Y., sewage treatment plant, for the Westchester County Department of Public Works, is proceeding in the dry with the help of a steel sheet-pile cutoff wall that blocks infiltrating water. The site of the $6,229,000 job consists of a 300×1,400-foot fill, surrounded by a riprapped dike, which projects into the Hudson River.

To keep the river-edge site dry, a joint venture—Poirier & McLane Corp. and Psaty & Fuhrman, Inc., both of New York City—drove 50-foot-long ZP38 sheet piles, rented from L. B. Foster Co., along the inside of the dike to elevation minus 32. The cutoff wall has three sides: a 925-foot section along the river; a 100-foot wing on the north; and a 160-foot wing on the south.

### Pile driving

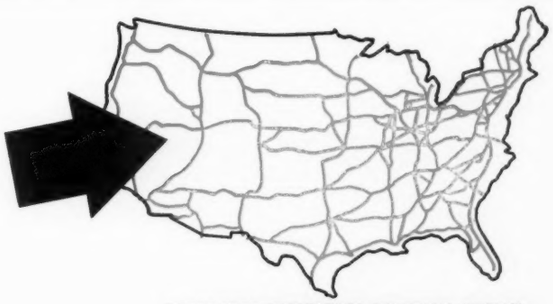
Sheet-pile driving was done by two cranes, one starting at the north end, the other at the center, and both working south. A Bucyrus-Erie steam crawler carried a McKiernan-Terry 9-B-3 hammer in 75-foot leads, and a Lorain crawler also handled a 9-B-3, supplied with steam from a Littleford generator. Using an H-beam laid flat on the ground as a guide, the rigs drove two sheet piles at a time.

A 50-foot gap was left near the center of the long side of the wall to provide for closure. A jib was added to one of the cranes so that it could reach high enough to position all closure sheet piles before actual driving. Using come-alongs, workers jockeyed the wall until closure was made. Then the remaining piles were driven.

As soon as excavation was completed, the subcontractor, Horn Construction Co., Merrick, Long Island, N. Y., brought in a Bucyrus-Erie 38-B, a Northwest No. 6, and a Manitowoc 3000, all equipped with leads and Vulcan hammers, to drive foundation piles. Supplementing the work of these crawler cranes is a Michigan Model 125A tractor shovel, which keeps the three drivers supplied with wood piles. Trailers that haul the piles to the job cannot reach all parts of the site; the Michigan often unloads them at the edge of the work, then pulls groups of piles to the rigs.

THE END


Another step toward this goal



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TEXACO ASPHALT

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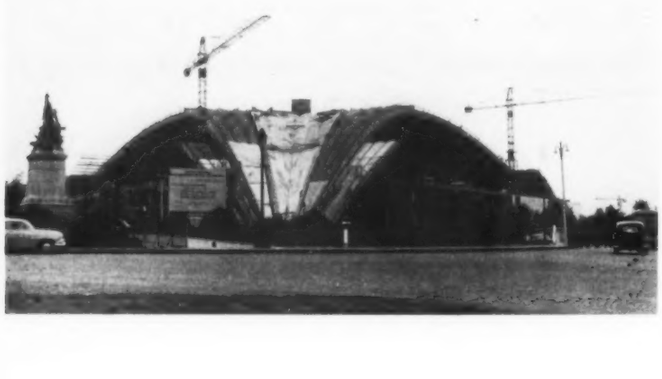
Three hammerhead cranes, one at each corner abutment, place concrete for the thin-slab corrugated shell roof. Also going up along each side of the big French hall is a four-story building constructed mostly of precast elements.

The world's largest free-span concrete structure is this huge exposition hall under construction at Paris. The three equal-length sides span 720 feet and rise to a height of 168 feet at the midpoint of the arch.

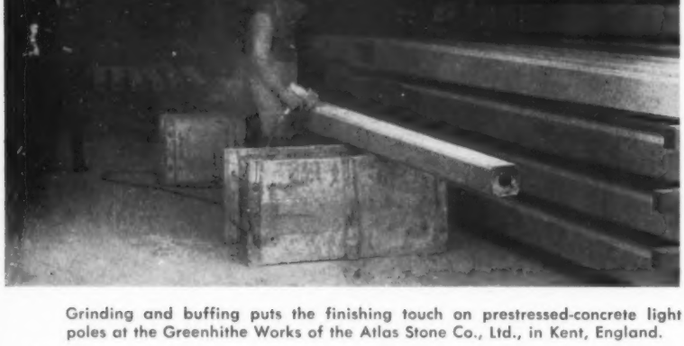


# Precast, prestressed progress in Europe



***Concrete techniques advance construction in Great Britain, France and The Netherlands***

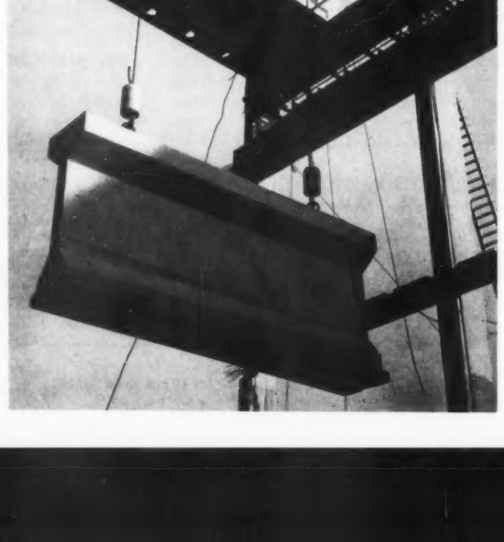
by **WILLIAM H. QUIRK**
**editor**



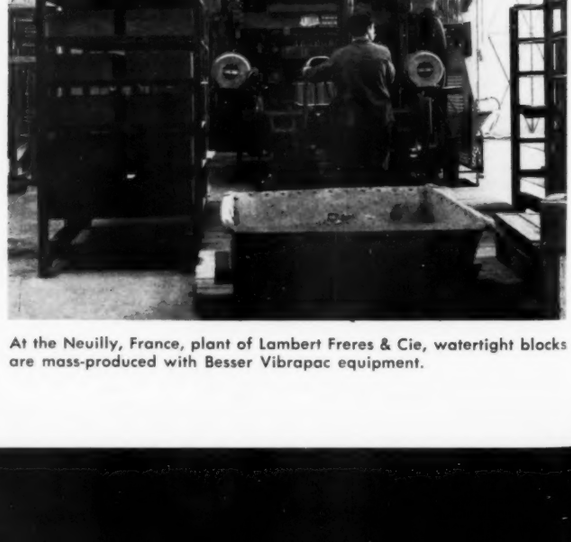
Grinding and buffing puts the finishing touch on prestressed-concrete light poles at the Greenhithe Works of the Atlas Stone Co., Ltd., in Kent, England.

An idea of the importance with which prestressed concrete is regarded in Great Britain is shown by the attendance of delegates at the Third International Prestressed Concrete Congress in Berlin. After the host state, Germany, Great Britain led the way in representatives with 118 delegates in attendance. Prestressed-concrete work in Great Britain comprises between one-fifth and one-quarter of the nation's construction in reinforced concrete. About 22,000 tons of high-tensile steel is used annually in prestressing operations. Great Britain's precast and prestress industry is engaged in the production of floor joists, beams, piles, lagging columns, light poles, sidewalk slabs, pipe, curbing, frame members, trusses, lintels, sills, purlins, etc. The manufacture of concrete railway sleepers has declined with the increase in timber imports from America.

By far, the greater proportion of prestressed work is the pretensioning of concrete units in factories. Post-



This post-tensioned prefabricated girder being raised to position is now part of the framework for the Van Gelder paper mill at Wormer, The Netherlands. The Freyssinet system was used in the tensioning. De Meteoor did the fabricating.



At the Neuilly, France, plant of Lambert Freres & Cie, watertight blocks are mass-produced with Besser Vibrapac equipment.

tensioning is done mainly at the site. In pretensioning operations, the average length of beds ranges from 100 to 200 feet; one plant has casting beds 460 feet long. The high-tensile steel wire most widely used is either 0.2-inch or 0.276-inch diameter, while the maximum size of bar employed is 1⅛ inch. Deformed wire has a wide acceptance. Concrete for prestressed work is high strength, testing from 6,000 to 8,000 psi at 28 days.

The larger-size elements produced average about 60 feet in length and from 5 to 10 tons in weight. Some units, however, weigh as much as 34 tons and have a length of 86 feet. One plant turns out 100-foot elements weighing 22 tons.

Prestressing is carried on by contractors and consulting engineers; by commercial firms which also may be suppliers of steel or specialized equipment; by municipalities; and by governmental ministries. Typical of the commercial firms engaged in precast and concrete work is the Atlas Stone Co., Ltd., with four plants scattered throughout England. Its largest operation is at its Greenhithe Works, downstream from London in Kent on the Thames River. Aggregate comes to the plant via water transport from either Cornwall or Scotland. The plant is equipped with Cumflow mixers, and its concrete products are made on order to prescribed specifications. No elements are mass-produced for future sales. The company is a member of the British Cast Concrete Federation, a trade association of concrete products manufacturers. H. E. Whitbread is director and president of Atlas Stone Co., Ltd., with headquarters in Westminster, London.

### France

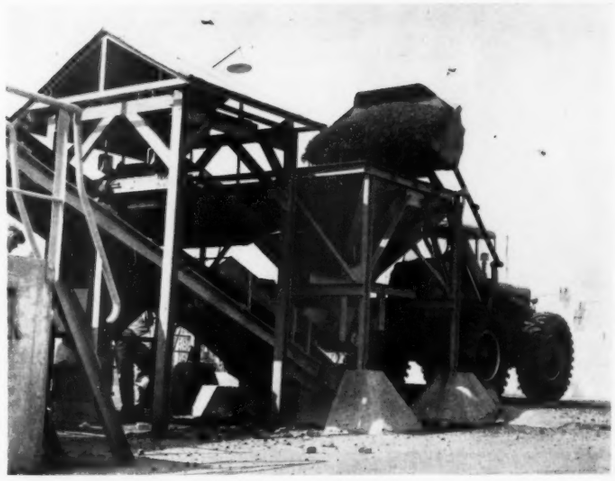
Paris is the center of France and also the center of its concrete industry. Two of the largest concrete producers in the Paris area are Lambert Freres & Cie and Les Betons Vibres de Verneuil.

Lambert Freres is located in Neuilly, a northwest suburb of Paris, where it manufactures cement as well as its chief product—concrete block. Lambert has four other cement plants in France. For coarse aggregate, Lambert relies mostly on silex, a by-product from its cement operations, the material being quarried with limestone and separated out in the crushing process. Natural deposits of sand supply the fine aggregate. Watertight blocks are turned out in mass production with Besser Vibrapac equipment. The Alpena, Michigan, concrete-block machine company also supplied the mixers and air-operated cubing machines for stacking the blocks.

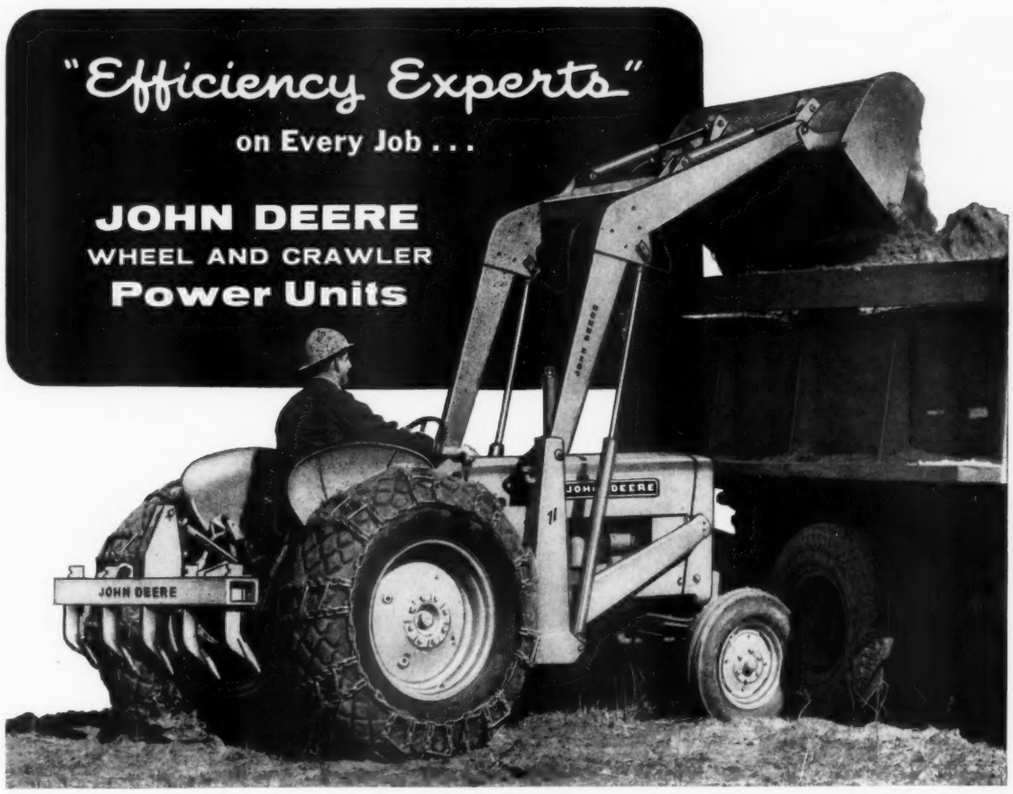
The load-bearing blocks, used mainly in building construction, are moved out of storage by Hyster forklifts. Shipments are usually handled by truck or barge. Lambert's location on the Seine River permits economical water transport to all sections of Paris and its environs.

Les Betons Vibres de Verneuil also manufactures a wide variety of con-

(*Continued on next page*)



An Allis-Chalmers Tracto-Loader dumps a bucket of cinders into a hopper bin feeding the conveyor at the concrete plant of Bredero-Beton, located near Utrecht, The Netherlands.


IT'S no wonder John Deere Wheel and Crawler Power Units are called "efficiency experts" wherever the big job is digging, loading, and hauling of dirt, sand, gravel, or other materials. That's a way of saying this equipment trims waste in every possible way, daily chalking up big savings for the owners.

It's common knowledge, for instance, that fuel costs drop when a John Deere goes on the job, thanks to its amazingly efficient power plant, famous for delivering so much for so little for so long. And it's just as widely known that these units have the convenient controls and operating responsiveness that mean getting the most out of every working hour—plus many construction features that give them greater stay-ability and assure greater savings in servicing and maintenance.

Your John Deere Industrial dealer will be glad to show you how you can trim operating waste, speed production with a John Deere Wheel or Crawler Power Unit. See him at the very next opportunity.

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A Besser air-operated cubing machine stacks blocks in the plant of Lambert Freres & Cie, Neuilly, France.

(*Continued from preceding page*)

crete blocks, lightweight but load-bearing, that are employed mainly in apartment house construction, four stories and under in height. B.V.V. has its plant at Verneuil, southwest of Paris, on the Seine where it obtains river sand and gravel for aggregate. Portland cement is used in block and beam production, while a lower price slag cement is employed in elements that are to be located below grade lines.

A German-made block machine is the chief production unit, while curing is done in an outside storage yard with water spray. The main market for the products is within a 40-mile radius of the plant. Deliveries are made either by rail, truck, or barge, with fork-lifts employed in handling the blocks stacked on pallets.

#### Exhibition hall

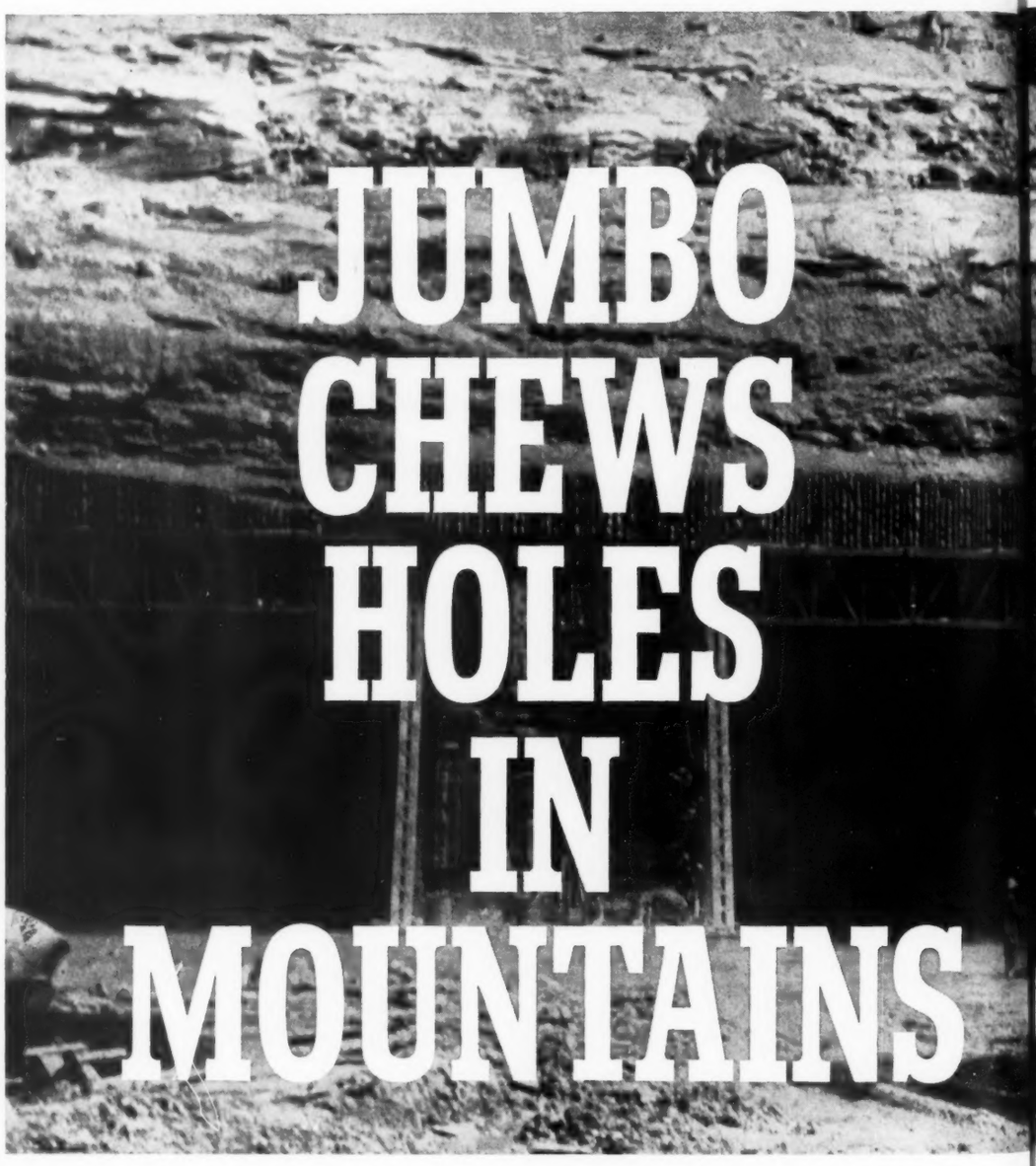
One of the largest, if not the largest, concrete building projects in France—or anywhere for that matter—is going up in Puteaux, northwest of Paris. A group of French business men are sponsoring the construction of a huge exposition hall which is scheduled for completion late this year at a cost of $10 million. The structure—Centre National des Industries et des Techniques—has the shape of an equilateral triangle in plan, with three 720-foot sides spanning between the corners. These sides arch upward to a height of 168 feet at each midpoint to form a vast thin-slab, corrugated, concrete-shell roof that covers a 5½-acre area; the total floor area is over one million square feet. The only supports are at the three corner abutments, making the hall the world's largest free-span structure.

The exhibition hall was designed by the French architectural firm of Camelot, deMailly & Zehrfuss, and is being built by a joint venture of ten companies known as Societe de Construction de la Defense. The site is a triangular plot off Place de la Defense at the western end of Avenue de Neuilly, leading out of Paris from the Arc de Triomphe. The three side walls of the huge exhibit area are built of glass supported on a light steel framework. The triangular-shaped, corrugated concrete roof is constructed of two shells, each about 2½ inches thick. Space between the inner and outer shells varies, from 6 feet over most of the area to 10 feet at the abutments. A tremendous network of falsework and tubular scaffolds supported the forms for the roof pours.

Extending along each of the exterior sides of the hall are four-story concrete buildings, mostly of precast construction. The three long buildings contain offices, meeting rooms, and smaller exhibit areas, The rectangular-shaped buildings, 420 × 85 feet, are connected to the industrial exhibit area, but are not structurally a part of it.

Concrete for the pours is supplied by a central plant, with truck mixers delivering to the job site. Concrete is bucketed to the forms by three hammerhead cranes. A crane is spotted close to each of the three corner supports. These supports or abutments are solid concrete blocks, 40 feet in depth, and are tied together by steel cables running below the floor level. The floor of the main exhibit hall consists of two slabs, one above the other and 6 feet apart, with the space between serving as a

At the Paris plant of Les Betons Vibres de Verneuil, a Salev fork-lift loads concrete blocks onto a Saviem truck.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This Jumbo drilling rig is Merritt-Chapman & Scott's solution to the Fort Pitt Tunnel Project, Pittsburgh.

Designed and built for the job by M-C&S, the Jumbo stands almost as high as a two-story house, mounts 12 pneumatic hammer drills capable of taking a 10-foot bite of solid rock. This truck-mounted drilling machine was designed to operate alternately in Fort Pitt Tunnel's twin tubes, each running 3,600 feet through solid rock.

*This Jumbo is 100% Texaco Lubricated*—and it hasn't had one minute of downtime due to lubrication. The reason for this fine performance is the combination of qualities in Texaco Rock Drill Lubricant EP: a highly refined mineral base with extra extreme-pressure and anti-corrosion properties. Texaco Rock Drill Lubricant EP protects against rust and wear even under the most severe conditions of load and moisture.

*Texaco protects compressors, too.* The two heavy-duty units that drive the Jumbo's drills are reliably protected against rust, sludge and foam by Texaco Regal Oil E R&O. This specially refined and fortified lubricant keeps discharge passages clear, keeps valves working properly and cuts wear to a minimum.

utility gallery. The upper floor is 3 inches thick and the lower is 2¼ inches. Triangular sections of floor, 20 feet to the side, were precast and then tied together by beams carrying prestressing wires. After the wires were stressed, the joints between the precast sections were filled with concrete.

### The Netherlands

In the past five years, 86 prestressed structures of major significance have been built in The Netherlands. As might be expected in a small flat country, traversed by numerous rail and highway transportation lines together with canals and waterways, 69 of these structures are bridges or viaducts. The remaining prestressed work includes buildings, quays, jetties, chimneys, silos, and even a sculptured group on top of a church tower. The latter, of course, was prefabricated. One of the biggest bridges, at Venlo in Limburg, crosses the Maas River on four spans of 51-61-61-51 meters, for a total length of 735 feet; its width is 22 meters (72 feet). The Dywidag system of prestressing was used on this structure. Other systems employed, in addition to pretensioned work, included those of Freyssinet and Magnel.

White traffic blocks for street and highway markings are one of the principal products of the N. V. Betonfabriek de Meteoor at De Steeg., The Netherlands. These markings are at a main intersection in Rotterdam.

The precast-concrete block industry has not made much headway in Holland in building construction, particularly in dwelling units. Brick is still the popular material for homes and housing developments. The Dutch brick is lighter and smaller than the English or American variety, and a good bricklayer in the Netherlands can lay 2,500 bricks a day, or about five times the number placed by a British artisan of similar skill. There are 240 firms producing brick in The Netherlands.

But the changing economy of the country is also changing its building habits. Prior to World War II, The Netherlands was mainly an agricultural state. Now it is about 40 per cent industrialized, and the new factories and plants going up are being built, for the most part, of concrete blocks and slabs. One of the leading producers of these building elements is Bredero-Beton with a plant at Utrecht on The Netherlands' canal system linking Amsterdam with the Rhine River. Paralleling the canal are a highway and railroad, also providing transportation for raw materials and finished products.

Cinders are used chiefly for aggregate in the manufacture of lightweight building elements. They are usually shipped to the plant by barge from sources in Holland or Germany, and stockpiled along the quay. As needed, front-end loaders dump the cinders to a hopper that in turn loads a conveyor belt feeding a crushing and screening plant. Blocks are mass-produced inside the plant which is equipped with Besser machines.

Another large manufacturer of concrete products is N. V. Betonfabriek De Meteoor, with a plant at De Steeg, 12 kilometers (7 miles) east of Arnhem on the river IJssel. This 50-year-old firm employs 650 people to produce such standard items as curbs, flags, pipe, striped traffic blocks, building elements, etc., as well as precast beams and girders for post-tensioning at the site, and its patented Stelcon industrial floors.

*(To be continued)*

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Working in the slag pile at Bethlehem Steel Co.'s plant in Bethlehem, Pa., a Marion Model 4161E electric shovel with 4-yard bucket loads a Mack 15-ton diesel. The trucks haul to a nearby crushing plant where the slag is reduced to size.

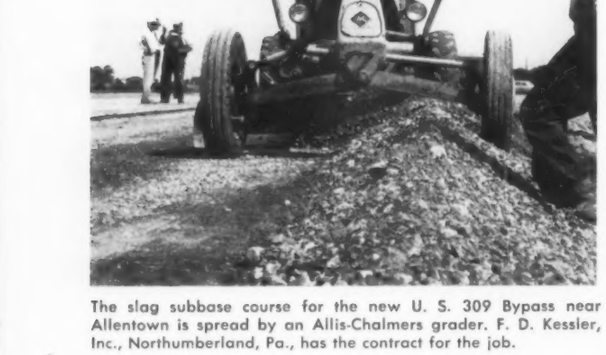
A 20-ton trailer dumps to a Jersey spreader pushed by a Caterpillar D8 as James D. Morrissey, Inc., Philadelphia, lays a slag aggregate course on a stretch of new highway near Allentown.

# Slag builds highways in Pennsylvania

by WILLIAM T. DARDEN, feature editor

The slag subbase course for the new U. S. 309 Bypass near Allentown is spread by an Allis-Chalmers grader. F. D. Kessler, Inc., Northumberland, Pa., has the contract for the job.

With reinforcing mesh in place, a Koehring diesel paver puts down the top 2 inches of slag concrete on a section of U. S. 22. A Blaw-Knox spreader follows the paver.



Compaction is the next step in the preparation of the 6-inch course. Here Morrissey uses a Buffalo-Springfield Kompactor on his 8-mile stretch of divided highway along U. S. 22.

A crew lays a slag sand course on the acceleration lane of the U. S. 309 Bypass. An International truck with Temple spreader dumps the material.

Blast-furnace slag—once considered merely a waste by-product of the steel manufacturing process, but today a popular form of aggregate—is the principal material being used in the construction of three stretches of new highway in Pennsylvania's Lehigh County.

Slag aggregate is being used for the base course and in pavement and bridge concrete on these projects, which represent the first use of slag as aggregate by the Pennsylvania Department of Highways in the eastern part of the state.

Major source of the slag for these jobs is the Bethlehem Steel Co.'s plant at Bethlehem, where some 1 million tons of the material is produced annually under normal conditions.

New Butler batch plant and aggregate bin provide slag concrete for Morrissey's job. The Link-Belt Speeder crane with Amsco 2-yard bucket charges the bin from the slag aggregate piles at left.

### Handling

Bethlehem uses a Marion 4-yard electric shovel to load the air-cooled slag to Mack 12-yard diesel trucks, which haul to a nearby crushing and screening plant. After the slag is crushed to size, it is loaded to contractors' haul trucks by Michigan 175A tractor shovels. The average haul from the slag pile to the job site on these three projects is 18 miles.

Typical handling of the base-course slag on the job consists of dumping the material to a tractor-pushed spreader, shaping it with a grader, and compacting it with steel-wheel rollers. A course of slag sand is then put down to fill the voids.

Other quantities of slag aggregate are stockpiled at batch-plant sites for use in pavement slab concrete.

Two of these three projects are for divided highway (two 24-foot lanes) on U.S. 22. J. D. Morrissey, Inc., Philadelphia, has a $3,818,329 contract for 8 miles between New Smithville and Fogelsville, while Glasgow, Inc., Glenside, Pa., is constructing 3 miles between Fogelsville and Chapmans under a $1,578,431 contract. F. D. Kessler, Inc., Northumberland, Pa., has a $2,770,000 contract for 4 miles of divided highway (two 22-foot lanes) on the Allentown Bypass for U.S. 309.

### Specifications

On Morrissey's job, 110,000 tons of slag is going into the subbase and another 47,000 tons into the pavement concrete. Glasgow is using 50,000 tons in the subbase and 20,000 tons in the slab. Kessler's contract calls for 108,000 tons of base aggregate and 30,000 tons of pavement aggregate.

For the most part, subbase specifications call for 6 inches of 2½-inch-maximum slag aggregate topped by one inch of slag sand (Pennsylvania No. 1 screenings). The 10 or 9-inch reinforced-concrete slabs contain 1½ and 2½-inch-maximum slag aggregate. Slag for use in concrete paving must be Type A blast-furnace slag.

Approximately 10,000 cubic yards of slag is going into concrete for four bridges on the Glasgow job. McClain Construction Co., Inc., Philadelphia, has the contract for these structures, and ready-mix concrete is being supplied by Frank Casilio & Sons, Bethlehem.

THE END


*Where tires are put to the test*

# You can do more for less

## on Tru-Seal Tubeless Rims

Wherever there's work to be done that's really tough on tires—you can be sure of this: You'll get more out of your tires – at lower cost – when they're mounted on Tru-Seal Tubeless Rims by Goodyear.

Tru-Seal is the only practical way to seal a multiple-piece rim. And, like all Goodyear rims, it provides other dollars-and-cents advantages:

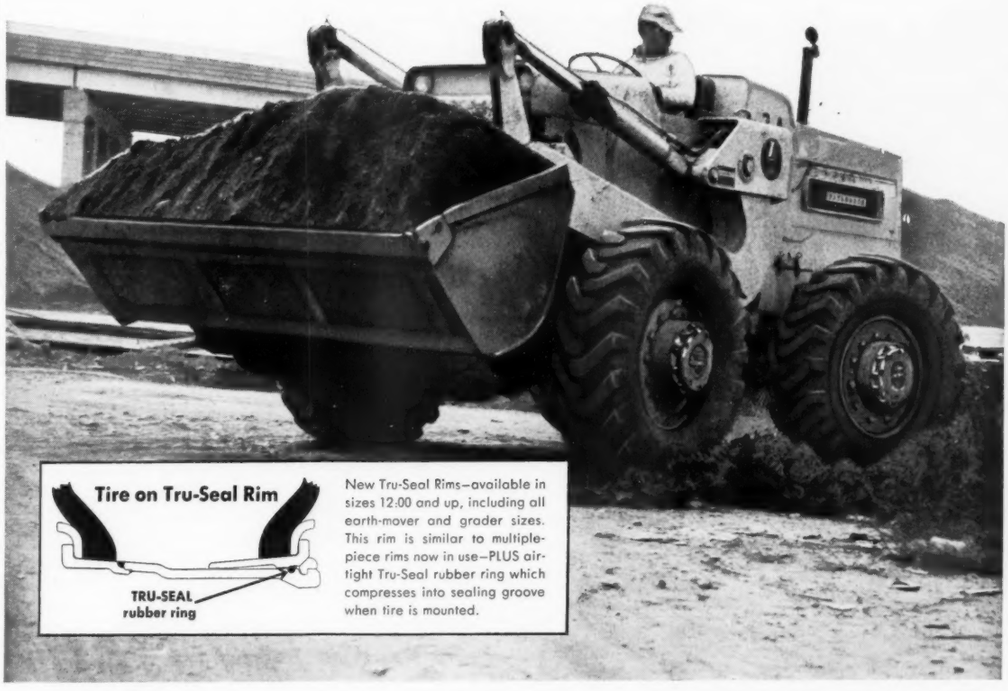
**Unusual Strength:** An exclusive double-welding process and added support at points of greatest stress make present-day Goodyear Rims far stronger than previous rims.

**Ease of Tire Mounting:** No tube and flap troubles.

**Special Tools:** Goodyear provides both hydraulic and hand tools especially made for off-the-road equipment.

**Bond-a-Coat Finish:** This protective coating affords long-lasting resistance to rust and corrosion.

If you have a rim problem, talk it over with the G. R. E. (Goodyear Rim Engineer). He'll save you time and money by helping you select the type and size of rim best suited to your needs. Write him at Goodyear, Metal Products Division, Akron 16, Ohio, or contact your local Goodyear Rim Distributor.




New Tru-Seal Rims—available in sizes 12.00 and up, including all earth-mover and grader sizes. This rim is similar to multiple-piece rims now in use—PLUS air-tight Tru-Seal rubber ring which compresses into sealing groove when tire is mounted.

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METAL PRODUCTS DIVISION

Tru-Seal—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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For more facts, use Request Card at page 18 and circle No. 205

# Basement digging time cut one-third

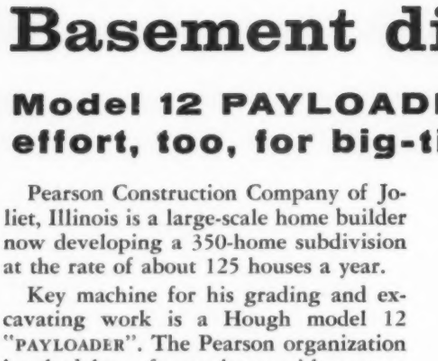
## Model 12 PAYLOADER saves operator effort, too, for big-time home builder

Pearson Construction Company of Joliet, Illinois is a large-scale home builder now developing a 350-home subdivision at the rate of about 125 houses a year.

Key machine for his grading and excavating work is a Hough model 12 "PAYLOADER". The Pearson organization has had lots of experience with tractor-shovels. It is familiar with all the types and makes that are available and what each can do. In fact, John Ambrosini, the Model 12 operator, has been on tractor-shovels for 18 years.

### Operator Antagonistic

He says, "When they brought the model 12 on the job, I'll admit I was antagonistic towards it as I had operated ..... tractor-shovels for 18 years. But the ease of operation, smoother ride and greater vision of the model 12 quickly sold me after I had operated it only a few minutes. The 12 is faster, has a bigger bucket and it's easier on me, because of the hydraulic - booster steering and power-shift transmission. I do the same work in 5 hours that it took me 8 before. I can dig a 300-yard basement with half the effort."



### Management Lists Advantages

D. L. Johnson says, "The first time we saw the Model 12 scoot across a field, we saw its possibilities on our subdivision. We don't build our houses in a row so tractor-shovel jobs are separated by as much as a mile.

"We first tried the Model 12 digging basements side by side with a ..... of equal size. These basements were 40 x 30 feet and the model 12 finished its hole one-third quicker."

### 6-8 Hours per Basement

"Our basements range from 250 to 300 yds. on the subdivision and the model 12 takes 6 to 8 hours on each one, including top soil removal. A basement is finished and ready for forming when the operator gets through."

Pearson does the complete earth-moving job in its subdivision development—cuts the streets, grades the lots, builds the curbs and sidewalks. The model 12 is the No. 1 machine for all this grading—even pulls tamping rollers.

### Works Where Others Can't

A big basic advantage of the model 12 design is the engine-in-rear that gives improved machine balance. It distributes the weight evenly over the entire track lengths — giving better traction, reducing the weight and strain on the front idlers. Because of this better balance the model 12 can work on soft spongy ground where others bog down in front. There are many advantages in the model 12 and they all add up to the fact that it makes all other tractor-shovels obsolete.

It will pay *you* to see a model 12 in action. Your Hough Distributor is eager to show you how it can do more jobs, faster and easier. The Frank G. Hough Co., 762 Sunnyside Ave., Libertyville, Ill.

10-C-1

*Modern Materials Handling Equipment*

**THE FRANK G. HOUGH CO.**

LIBERTYVILLE, ILLINOIS

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

SAY "HUFF"

For more facts, use Request Card at page 18 and circle No. 206

# Off-highway tires represent hidden profits

by CARL D. SMITH
consultant on giant off-highway tires

Sections of three kinds of tires illustrate comparative tread widths and depths. Left to right: highway, earthmover, off-highway rock tire.

An important but sometimes neglected source of profit for today's contractor is to be found in the savings realized through wise purchasing. This applies whether the purchase involves machinery, materials, or components.

In the last category, tires can represent a considerable expense for the contractor—particularly one engaged in earthmoving work. The purchase and maintenance of these necessary components are both potential sources of substantial saving, and yet contractors and other users too often pay little attention to the selection and efficient upkeep of their tires.

Giant off-highway tires are expensive items, and savings on these units begin with proper selection of the tire with regard to tread radii and curvature, and tire body deflection. Too much tread radius, or curvature, means excessive deflection—a condition ruinous to tire life even at off-highway speeds of 25 or 30 mph.

Similarity of tires ceases with the fact that all are round and black. Specifications differ widely. And while the buyer most often has to take the word of the dealer for internal construction, he can see and measure outside dimensions, including tread width and depth, as well as tread radius, or curvature.

For our purposes here, tires fall into three main categories: highway; off-highway, or earthmover; and rock, or traction. A discussion of the evolution of the second two types will help to illustrate the importance of tire construction in the various types of service.

### Highway tires

In the early days of off-highway work, before the special needs of this type of service were known, ordinary highway tires were used.

These highway tires, by the nature of their operating on long hauls over hard-surfaced roads at relatively high speeds, require a nearly flat tread and high air pressure so that deflection will be held to a minimum. An example is the highway tire with a tread radius of 10.94 inches (10:00 section) and a tread shoulder only 0.64 inch from the flat of road surface, to hold to a maximum of 12½ per cent deflection.

(*Continued on next page*)

Mobil LEVELS OFF
*High Operating Costs!*

**Mobil's Contractor PM System and Correct Lubrication Program cut down equipment breakdowns!**

More and more contractors are finding out that Mobil's simplified Contractor PM System helps lengthen equipment life . . . reduce wear that keeps equipment in the shop. It's designed to cut down paper work, prevent breakdowns that make costs soar.

This valuable system is an important part of Mobil's Correct Lubrication which also includes:

*Famous Quality Products* such as Delvac Oils, New Mobilube GX Multipurpose-type Gear Lubricant and Mobilgrease.

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Your Mobil representative will be glad to show you how useful this system can be. Get in touch with him.

**CONTRACTOR PM SYSTEM INCLUDES:**

1. Record Folder—provides identifying data for each piece of equipment, holds equipment records.
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3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipment, work to be done or completed.
4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

*Available—film on equipment safety, maintenance. Call nearest Socony Mobil office.*

Mobil *Correct Lubrication*
*Another reason you're Miles Ahead with Mobil!*

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION
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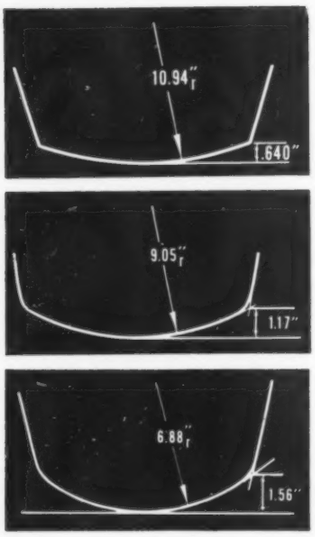


Diagrams of 10:00-section tires, showing comparative tread radii and distances from tread shoulder to road surface. From top: highway tire, with 12½ per cent deflection; rock tire, with deflection of 20 per cent; earthmover tire, with deflection of 25 per cent.

*(Continued from preceding page)*

### Earthmover tires

The earthmover tire as a specialized component was developed because regular tires failed on off-highway work. The need for different tread contour and flexing characteristics, along with low air pressure, was soon recognized. The new type of tire was designed for free rolling (rather than driving power) service over broken earth filled with rocks, at speeds not exceeding 10 mph. Crawler tractors were seen as the ideal prime movers for this operation.

Much field experience was necessary before the present earthmover tire evolved. From the very beginning, however, its design incorporated features which would overcome the hazards of off-highway work.

Taking advantage of its slow speed of operation, tire manufacturers designed the earthmover tire with a "round" tread for some 25 per cent deflection with slow-speed restrictions. A typical 10:00 earthmover tire has a tread radius of 6.88 inches, with the shoulder 1.56 inches from the flat roadbed.

### Rock and traction tires

When rubber-tire tractors came into the picture, new tire problems arose. Traction and greater speed, with grader-maintained roads, made the earthmover tire inadequate for the job. It became evident that the tread of the earthmover tire was too round, and that 25 per cent deflection was too much for the greater speed, which jumped from a maximum of 10 mph to 25 mph or better.

To meet this new service requirement, we have, after years of engineering and development, a 10:00-section rock tire with a tread radius of 9.05 inches and a shoulder 1.17 inches from the flat roadbed. Maximum deflection is around 20 per cent.

Summarizing, then, we have the following specifications for the 10:00 tire in these three types:

| | High-way | Rock | Earth-mover |
|---|---|---|---|
| Speed | 50-60 | 25-30 | 10 |
| Roadway | hard-top | graded | ungraded |
| Radius | 10.94 | 9.05 | 6.88 |
| Deflection | 0.64 | 1.17 | 1.56 |

This summary of the specifications for the three classes of tires for hauling service shows that the harder and longer the road, the flatter should be the tread for higher air pressure and the less deflection permissible. Where roads have no hard top and abrasive materials are encountered, some relief must be given the tread by lowering the air pressure in the tire. Under these latter conditions, the tires deflect some 20 per cent, a condition calling for a tread with a shorter radius (more curvature) than that on a highway tire but greater than that on an earthmover.

In the wide-base 29.5 ×29, one manufacturer produces a traction tire and a rock tire in two distinctly different tread radii, or curvatures.

The traction tire has a tread radius of 19.50 inches and must deflect 5.32 inches for the tread to flatten out. The rock tire has a tread radius of 24.56 inches and needs a deflection of only 3.62 inches to flatten out its tread. The traction tire thus needs 47 per cent more deflection.

Translating these specifications into the language of everyday use, we find that the traction tire should be used only in soft going where the round tread can sink in. It should not be used on hard or firm-surfaced

Outside Camarillo, Calif., U. S. 101 is being relocated and improved. J. E. Haddock Ltd. is handling 5-mile project, moving a million and a half cu. yd. — mostly rock. Haddock moves about 7,000 cu. yd. a day.

Four CAT D9 Tractors are on the job here, along with five D8s, No. 12 Motor Graders, three DW21s with Scrapers, three DW21s Athey PR21 Wagons, and a D13000 Caterpillar Diesel Engine.

Two of the three Caterpillar DW21 Tractors with Athey PR21 Wagons loading up for another fast rock haul on U. S. 101 project. Conditions like this explain why Project Supt. Saul says he picked Caterpillar for its "ability to do the tough work."

Athey PR21, teammate of DW21 Tractor, can haul 34 tons of or other material efficiently. On this job it hauls about 18 cu. making 1-mile round trip in about 12 minutes—against a return of 12% in places.

roads, where it will either ride on the center of the tread or overflex and shorten its service life.

On the other hand, the rock tire with its semiflat tread, which under load lays down its entire tread surface on the ground, gives more traction, better breaking, and longer tire wear, all of which mean low tire operating costs.

This discussion of the basic features of off-highway tires will, it is hoped, give contractors information which will be valuable when they come to selecting tires both for new equipment and as replacements. The result should be more efficient performance and lower tire costs and maintenance.

*(Continued next month.)*

*This is the first of a series of articles by Carl D. Smith, consultant in giant off-highway tires. It is intended to show contractors how they can achieve the lowest possible tire costs through the proper selection and use of off-highway tires, and how tires themselves affect operating efficiency and—ultimately—profit and loss.*

CLEARING THE MAIN STREET of Batavia, N. Y., is a typical cold-weather job for the Trojan Model 404 tractor shovel. Here it loads snow, which it had previously stockpiled, with a specially built snow bucket. The bucket permits the Trojan to load 5 cubic yards of snow with each pass.


# RELOCATING U. S. 101

"This job is plenty tough. We called on Caterpillar-built equipment for this one. We get good service with very little down time—and then our Caterpillar Dealer goes all out to see that our machines are back at work as soon as possible."

Project Supt. Neal Saul's words should ring a bell for you, too. See *your* dealer for the machines that handle the tough jobs in stride. See him for replacement parts you can trust. See him for the fast, thorough service that keeps your machines making money.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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**WHEN THE JOB IS PLENTY TOUGH**

th No. 9S Bulldozer moves rock in a hurry. The LOAD SHAPE No. 9S 14-ft. blade with a cutting edge made of "Hi-Electro" hardened A push cup mounts easily, right onto the blade, when desired. The livers 320 HP at the flywheel. With its optional three-stage torque ter, the D9's output is automatically matched to the load.

## Schupack, Zollman open civil engineering firm

Morris Schupack, formerly chief engineer and vice president of the Preload Co., Inc., and Charles C. Zollman, of Charles C. Zollman & Associates, have joined together to form Schupack & Zollman, a new civil engineering company specializing in precast and prestressed-concrete work for governmental agencies and industry.

The firm maintains offices at 211 E. 37th St., New York City, and at 3605 Chapel Road, Newton Square, Pa.

## B. F. Goodrich expansion

The B. F. Goodrich Tire Co., Akron, Ohio, begins construction, this month, of a factory warehouse addition to its Miami, Okla., tire plant which produces large off-the-road tires.

Grover S. Ramsey has been appointed sales representative in Michigan for the B. F. Goodrich Chemical Co., Cleveland, Ohio. The new sales territory was created to provide better service of Hycar special-purpose rubber to the automotive industry. Ramsey has headquarters in Detroit.

## Western acquires larger facilities

Western Industries, Inc., Chicago, Ill., has acquired larger office and manufacturing facilities at 2726 W. 36th Place. The building provides 70,000 square feet of floor space. Western Industries and the Western Railway Supply Co., Division make industrial lifting jacks and automatic parking gates for off-street car parking. Western recently purchased the industrial jacks and railway supply section of Allis-Chalmers' Buda Division.

## Eskridge Equipment acquires Welded Products

The Tulsa, Okla., firm of Eskridge Equipment Co. has taken over the manufacturing and sales of Welded Products Co., Oklahoma City, and moved the entire operations to the Tulsa plant. The Welco line will be enlarged and mechanically redesigned to include the latest improvements. Eskridge Equipment's new line of pneumatic rollers recently came off the assembly line.

Plans are being made to perfect the dealer organization to cover the U. S. and some foreign countries.

←For more facts, circle No. 208

Material excavated from canals for the Cape Coral development near Fort Myers, Fla., is dumped on the site by an Allis-Chalmers 160 scraper, one of a fleet of six units on the job. The A-C 45 motor grader is being used to level off the fill on the 2,100-acre site.

# Scraper fleet and dragline shape

***Fleet of six scrapers handles 5,500 yards of material daily as 54 miles of waterways are excavated for 2,100-acre tract***

*(Additional photo on front cover)*

One of the largest subdivision projects along the East Coast is quickly taking shape on 2,100 acres near Fort Myers, Fla., where draglines and scrapers are moving 7,000 and 5,500 cubic yards of material, respectively, per 10-hour day.

This area, under development by the Gulf Guaranty Land & Title Co., Fort Myers, is known as Cape Coral and is located on the Caloosahatchee River opposite Fort Myers.

**Excavate canals**

Included in the earthmoving phase of the project, which will take an estimated three years, is excavation of over 54 miles of navigable canals to provide waterfront property for 3,548 homesites. In addition, 1,890 water-view homesites are being developed, and two lakes and a 200 × 300-foot yacht basin will be excavated.

The canals, varying from 80 to 200 feet in width and 8 to 22 feet in depth, are being trimmed to 3 to 1 slopes to provide an easy grade between each house and dock. Fort Myers Construction Co., the grading contractor, started canal excavation with four Link-Belt cranes: two LS-98's with 45-foot booms and 1½-yard dragline


# How B.F.Goodrich on-the-job tire service eliminates delays, saves you money!

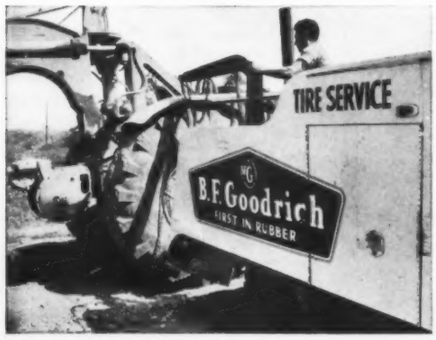
B.F.Goodrich

OUR B.F.Goodrich Tire Service Men are specially trained to handle on-the-job servicing. No matter how big the tires, how intricate the equipment, how complicated the repair job, you can count on fast, expert service when you call us. This is why you save on costly down-time, eliminate unnecessary delays and cut operating costs with B.F.Goodrich on-the-job service.

Why not call *right now* to find out about our complete program of B.F.Goodrich preventive tire maintenance. Without obligation we will inspect all your tires, point out tires that should be repaired or replaced, select tires for retreading by factory-tested and proved B.F.Goodrich methods, set up a proper inflation program and start you on a program of regular tire rotation and inspection.

Call us for all your tire needs and tire servicing problems. We carry a complete line of B.F.Goodrich tires and maintain a fully-equipped Servicemobile.

***Specify*** **B.F.Goodrich Tubeless or tube-type tires when ordering new equipment**




**B.F.Goodrich Servicemobiles** are equipped with hydraulic cranes, pneumatic wrenches, bead jacks and all the latest tools for efficient on-the-job tire service.

**See us for B.F.Goodrich off-the-road tires and service or check Yellow Pages of phone book for more complete listing in your area**

# B.F.Goodrich tire

A Graco lubrication unit on a Ford truck is used to service all rigs daily on the work. This A-C scraper, not serviced in the two-hour period before work started, is being taken care of during the lunch break.

# ...hape waterfront development

by ANTHONY N. MAVROUDIS, field editor

buckets, a K375 with a 70-foot boom and a 2½-yard drag bucket, and a K570 equipped with a 3½-yard dragline bucket on a 70-foot boom. All rigs use Hendrix perforated dragline buckets.

After the job started, a fleet of Allis-Chalmers scrapers and push-tractors was added to assist in the work. Excavated material removed by the draglines is temporarily stockpiled along the canal edges to be removed by the scrapers. All of the material is being used to build the site grade up to a minimum of 6½ feet above mean sea level.

Six Allis-Chalmers scrapers—three 200's and three 160's—haul the excavated canal material throughout the development. Whenever conditions are favorable and an area is free of water, the contractor uses the scrapers to excavate the canals. Draglines pile the lime rock, muck, and mud along the canal lip, allowing the water to drain back into the canal. Scrapers can then be push-loaded at the top of the pile.

The four Allis-Chalmers tractors on the job include an HD-20 pusher equipped with a torque converter, two

*(Continued on next page, Col. 4)*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...NISTON . . . . . ADams 5-2871
...MINGHAM . . . . . FAirfax 2-0361
...CATUR . . . . . ELgin 3-9523
...DSDEN . . . . . LIberty 6-5271
...NTSVILLE . . . . . JEfferson 5-2487
...OBILE . . . . . HEmlock 2-2681
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...DESTO . . . . . LAmbert 2-1005
...KLAND . . . . . Highgate 4-2800
...CRAMENTO . . . . . GIlbert 2-3811
...N BERNARDINO . . . . . TUrner 8-0947
...N DIEGO . . . . . BEImont 2-3131
...N FRANCISCO—Perry&Whitelaw,Inc.UNderhill 1-1801
...N JOSE . . . . . CYpress 5-6050
...N MATEO—Perry & Whitelaw, Inc. . DIamond 2-2051
...OCKTON . . . . . HOward 6-9691
...N NUYS—Ben Rudnick . . . . . STanley 3-2066

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...KELAND . . . . . MUtual 2-0331
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...LA . . . . . MArion 2-4254
...LANDO . . . . . GArden 3-3161
...NAMA CITY . . . . . POplar 3-3981
...NSACOLA . . . . . HEmlock 8-3181
... PETERSBURG . . . . . 7-1197
...MPA . . . . . 8-0181
...ST PALM BEACH . . . . . TEmple 2-4181
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A TRACK ROLLER is removed from a Cat D8 low-ground-pressure tractor for repair in the Antarctic during the 18-month-long Geophysical Year. Tractor maintenance in that area is performed under the most primitive conditions, and mechanics servicing and repairing machines in the open have established many maintenance techniques that are now standard for Antarctic operations.

Ellis L. Armstrong, commissioner of the U. S. Bureau of Public Roads.

## Utah roads director named to top BPR post

Ellis L. Armstrong, director of highways for the Utah State Road Commission, has been named commissioner of the U. S. Bureau of Public Roads.

For 20 years, following college graduation, Armstrong was with the Bureau of Reclamation working in design and construction supervision of such projects as the Republican River dam at Trenton, Nebr., and the Aswan Dam in Cairo, Egypt. Returning to the U. S., he joined Uhl, Hall & Rich, design engineers on the St. Lawrence Power Project. At the request of his one-time civil engineering professor, now Utah's Gov. George D. Clyde, he came back to his native state as state roads director.

(*Continued from preceding page*)

HD-16's with converters, and an HD-6. These push-load the scrapers and spread the fill. An A-C 45 motor grader handles final grading.

Since the area has a flat grade, the contractor is having no problems maintaining high production figures. The only difficulty was caused by rains that made the site very sloppy and slowed down the equipment. Timber mats, made of 10 × 10-inch timbers bolted together, are used by the heavy dragline rigs to increase bearing on the soft ground.

The 70 miles of roads being built throughout the subdivision by a subcontractor are designed to meet Lee County specifications and will be maintained by the county. Roads consist of a course of crushed shell, primed with asphalt by an Etnyre pressure distributor. A second coat of asphalt is added before the course is choked with crushed stone. After being rolled with a steel-wheel roller, the road is opened to traffic for a few weeks. Then it is primed, choked, and rolled again.

### Equipment maintenance

The contractor is using a Graco lube unit mounted on a Ford truck to lubricate the earthmoving fleet on the job. The service crew generally begins work at 5 a.m.—two hours before the machines start rolling—to check fuel oil and grease, and make any repairs that are necessary. Whatever rigs are missed at this time are caught during the lunch break. Major repairs and preventive maintenance operations are done on Saturday, if possible.

### Personnel

Russ Lowery is the superintendent of Fort Myers Construction, and Tom Weber is the resident engineer for the Guaranty Land & Title Co., which has Leonard Rosen as president.

THE END


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*Now you can boost earning power of your present tractor-driver fleet with Clement Dual Trailers.*

They are designed to pull behind your present dump units or in-train. Either way, you add two payloads of 8 to 10 yards on every haul with one tractor, one driver . . .

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The pilot model of the Koehring Skooper—very similar to the production model—loads into the Model 100 10-yard Dumptor. The bucket being used is a 2½-yard rehandling unit.

In the foreground is the Model 435 35-ton truck crane. On the bunting-draped stand in front of the spectators is K. R. Chandler, Assistant Sales Manager of the Koehring Division.

With the impressive array of Koehring equipment for 1958 serving as background, the Model 34E Twinbatch paver parades across the demonstration area.

## Eleven new equipment models displayed at Koehring show

Demonstrating confidence in the future of the construction-equipment industry, the Koehring Co. and two of its divisions—Parsons and Kwik-Mix—introduced 11 new equipment models during 1958.

The late models were recently paraded at a spectacular 3-day show at the company's proving ground west of Milwaukee. Dealers, bankers, and members of the press viewed the display of over $1 million worth of equipment.

Leading the parade of new equipment was the Koehring 205 Skooper. A cross between a shovel and a front-end loader, the new excavator is reviewed in the Product Parade section of this issue.

Five new cranes went on the market this year—four truck cranes and one crawler—ranging in size from 25 to 45 tons capacity.

Put through its paces at the show was a new 10-yard Dumptor. Similar in operation to its smaller brother, the new Model 100 Dumptor is capable of speeds up to 20 mph and loads to 30,000 pounds. A pivoting seat and two steering wheels permit the operator to drive in either direction without turning the machine around.

Another unit introduced this year was a new transverse finisher. Featuring a single lever adjustment for crown transition, the one-man-operated finisher has two hydraulically raised oscillating screeds. Traction speeds range from 8 to 20 fpm.

Demonstrated at the show was the new Parsons 77 ladder-type trencher, designed primarily for digging cable trenches to depths up to 5 feet and widths from 6 to 18 inches.

The much larger Model 310 trencher has been redesigned to offer many new working advantages. Capable of handling trenches up to 19 feet deep and 24 to 72 inches wide, the Parsons 310 can put out 4 cubic yards of spoil per minute.

Rounding out the demonstration of late models was the Kwik-Mix Hi-Lifter. Featuring a telescopic boom, the fork-lift can make 22½-foot lifts.

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*The Garden State Parkway-New York Thruway link carried 2.2 million vehicles during its first year of operation.*


FELKER di-lock

a diamond blade so good it makes all present guarantees unimportant!

Here's the diamond blade that has consistently outperformed on every fairly conducted competitive test in the field . . . **regardless of material, regardless of the machine!** Why? DI-LOCK revolutionized the industry by introducing a major improvement in diamond blade manufacturing technique. Completely new, the DI-LOCK method insured a stronger bond, anchored its diamonds tighter than ever before possible. **As a result, DI-LOCK retains its diamonds longer under shattering impact and severe abrasion. This means more footage, longer blade life, lower cost per foot!**

Major contractors using blades in volume have thoroughly tested all brands. DI-LOCK is the uncontested winner. **If you're tired of unsupported claims, if you want to eliminate all gamble in blade quality, insist on Felker DI-LOCKS** . . . FIRST CHOICE in diamond blades from coast to coast!

FELKER MANUFACTURING CO.
Torrance, California
*"World's Largest Manufacturer of Diamond Abrasive Cut-Off Blades and Machines"*

For more facts, use Request Card at page 18 and circle No. 211

## Names in the news

Clarence W. Unger, new project manager of The Edward Gray Corp.

### Edward Gray Corp. names Unger project manager

Clarence W. Unger has been named project manager by The Edward Gray Corp., general contractors, engineers, and industrial consultants of Chicago, Ill., and Pittsburgh, Pa. Unger has been assigned to the firm's Pittsburgh office.

### ASCE awards prizes

Prof. Anestis S. Veletsos and Dr. Nathan M. Newmark of the University of Illinois departments of civil engineering and structural engineering, respectively, have been named co-winners of the Norman Medal of the American Society of Civil Engineers for their paper, "Natural Frequencies of Continuous Flexural Members". The 1958 Ernest E. Howard award also went to Dr. Newmark for his contributions in the field of structural analysis and design, and specifically for his aseismic design of the Latino Americana Tower in Mexico City.

Associate professors of civil engineering, H. Bolton Seed, University of California, and Lymon C. Reese, University of Texas, are co-winners of the Thomas A. Middlebrooks award for their paper, "The Action of Soft Clay Along Friction Piles".

The prizes will be officially presented at the society's annual convention in New York on October 15.

### Eastern Ocean District headed by Col. Whitesell

Col. Carlin H. Whitesell has been named district engineer of the Eastern Ocean District of the U. S. Army Corps of Engineers. He replaces Col. Aldo H. Bagnulo, who has been assigned to the Army Engineer Center, Fort Belvoir, Va.

The Eastern Ocean District, located in New York City, is one of the largest of the Corps' 50 districts. It performs construction for the Army and the Air Force in Canada, Greenland, Iceland, Bermuda, and the Azores. The district's 1958 construction program totals $189,721,800.

### News from Pennsylvania department of highways

Erwin C. LaHaine and Robert L. Brown have been appointed bridge design engineer and civil engineer, respectively, for the Pennsylvania Department of Highways. LaHaine will work in the central office in Harrisburg, and Brown in District 5 office, Allentown.

### F. L. Brown opens Brown Engineers

Francis L. Brown, former senior partner of the recently dissolved firm of Brown & Blauvelt, continues his 20 years of professional engineering practice as head of Brown Engineers and Brown Engineers International, architects, engineers, and planners with headquarters at 60 W. 55th St., New York City.

A former deputy superintendent of public works for New York State, Brown has added to the firm a master planning department for city and urban development planning. Services provided by the organization include feasibility and economic reports, assistance in financial planning, master planning, engineering and architectural design, construction supervision, and management of completed facilities.

### Austin Co. appoints

The Austin Co., Cleveland, Ohio, has appointed Edmund W. Hollister as assistant manager of the company's 14-state Cleveland District. Hollister has been with the engineering and construction firm since 1940, in various engineering capacities.

### NSCE names director

Russell P. Westerhoff, a vice president and director of Ford, Bacon & Davis, Inc., New York firm of management consultants and engineers, has been named to a two-year term as a director of the National Society of Professional Engineers. He represents the New Jersey Society of Professional Engineers.

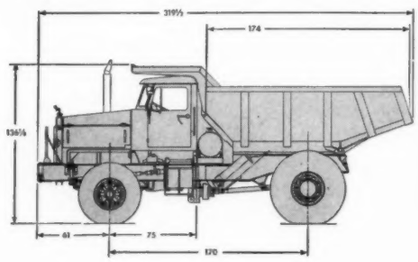
### Pennsylvania pike news

Samuel A. Schlouch has been named a district maintenance superintendent by the Pennsylvania Turn-

MACKS FOR EVER

MACK MODEL LVX

As a 22½-ton rear dumper, the off-highway LVX offers maximum payloads at minimum unit cost. With either a 320- or 335-h.p. diesel engine, an over-gear transmission with two-speed compound or torque converter, and Mack's Planidrive rear axle . . . the LVX is a top performer under all operating conditions. Maximum driver efficiency is assured by such features as ideal steering wheel position, power steering, two-plate air-assisted clutch, and Mack offset cab with extreme left driver position offering maximum view front and rear. From top to bottom, this Mack has the features that have made it the popular "big boy" for heavy construction.



CONDENSED SPECIFICATIONS

**PAYLOADS:** Rear dumper, 22½ tons.

**DIESEL ENGINES:** 320 h.p., supercharged Cummins; 335 h.p., turbocharged Cummins.

**TRANSMISSIONS:** Mack, selective, constant mesh, 8 speeds forward, 2 reverse; converter and Mack 4-speed transmission; Torqmatic converter and transmission.

**CLUTCH:** Mack two-plate, air assist with manual actuation.

**FRONT AXLE:** Mack, heavy-duty, drop-forged I-beam.

**REAR AXLE:** Mack Planidrive, with final reduction through planetary gears within wheel hubs.

**BRAKES:** Full air, with 12 cu. ft. comp

**FRAME:** Alloy steel, wide flange I-bea

**SPRINGS:** Front, semi-elliptic with
Shock Insulator suspension; rear, progr
rate semi-elliptic with cam face slipper
and radius rod.

**TIRES:** Front, 14.00-24 (16P) rib or 1
(20P) rib; rear, 18.00-25 (24P) lug.

**WHEELS:** Cast, spoke.

**STEERING:** Hydraulic power steerin
turning circle diameter.

**DUMP HOIST:** Twin, double-acting
board mounted, three-section telescop
inder assembly, providing 70° dumping

pike Commission. From headquarters at Bowmansville, Schlouch will be in charge of the turnpike from Blue Mountain Tunnel to Brandywine.

The new appointee succeeds Charles W. Hoppes, who has been made assistant general maintenance superintendent for the toll road. He is responsible for the east-west road from Harrisburg to the Ohio state line.

### AISC district engineer

Clyde Guder has been appointed district engineer of the St. Louis, Mo., area for the American Institute of Steel Construction. He will serve as an adviser to architects, engineers, and contractors, and will assist school engineering departments and others by providing technical information and visual aids relating to steel fabrication and construction.

### Naval engineer chiefs named rear admirals

President Eisenhower has approved the selection of two officers from the Navy Civil Engineer Corps to be promoted to the temporary rank of rear admiral. The first is Rear Adm. Eugene J. Peltier, who has been serving as a rear admiral since his appointment, last year, as chief of the Bureau of Yards and Docks.

The second is Capt. Henry G. Clark, Commander, Naval Construction Battalions, Atlantic, with headquarters at Davisville, R. I. He is being promoted to fill the vacancy created by the retirement of Rear Adm. Charles L. Strain.

### Construction group names new secretary-treasurer

Richard E. Chislett has been appointed secretary-treasurer of the National Constructors Association to succeed C. B. Bronson. Chislett was

Richard E. Chislett, secretary-treasurer of the National Constructors Association.

formerly chief of the Employer Relations Section, International Labour Office, Geneva, Switzerland.

The NCA is an organization of engineering and building firms specializing in the design and construction of chemical plants, petroleum refineries, steel mills, and power plants.

### Engineering firm names

J. B. Blackburn has joined the firm of Harland Bartholomew & Associates, city planners, civil engineers, and landscape architects of St. Louis, Mo. A former associate professor of civil engineering at the University of Maryland, Blackburn will now be responsible for the transportation and traffic engineering aspects of the firm's work. He will have headquarters in the home office.

### ARBA official dies

Robert L. Smith, public relations director of the American Road Builders' Association, died last month. Smith had been with the association since 1953, serving as editor of its official magazine and tri-monthly Newsletter, as well as handling public relations. He is survived by his wife and daughter.

### Kansas makes Martin director of highways

Maurice Martin, acting director of highways for Kansas since the death of Lynn R. Brodrick in January, has been made director of highways for the state. Martin joined the Highway Commission as assistant to the director in September of last year. Before then, he had served 17 years with the Federal Internal Revenue Service.

### Maxon Construction elects three officers

Three new officers of Maxon Construction Co., Inc., Dayton, Ohio, took over their posts last month. The three—all vice presidents of special departments—are Wilbur L. Jenks, Joseph C. Smith, and Thomas J. Scott.

Jenks is vice president of the Commercial and Industrial Building Department; Smith holds a similar post in the Power and Nuclear Facilities department; and Scott is vice president of Marine and Heavy Construction.

### McGraw vice president

Joel M. Morris has been made a vice president of F. H. McGraw & Co., engineering and construction firm of New York City. Morris, assistant to the president and former chief engineer, will be concerned with new engineering and construction developments.

ONSTRUCTION JOB

excavating...
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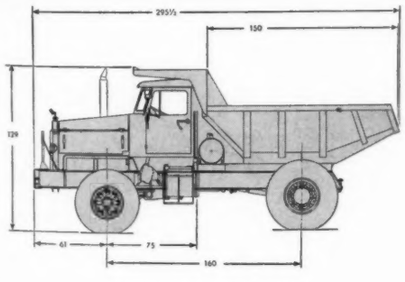

MACK MODEL LRX

The 15-ton LRX offers outstanding maneuverability with off-highway stamina and capacity. Powered with either a Mack or Cummins diesel engine and equipped with a Mack ten-speed transmission and Planidrive rear axle assembly, the LRX is an efficient performer on long hauls as well as steep grades. Powerful air brakes, carefully engineered cab, and rugged unified frame assembly have long made the LRX a popular model for earth or rock hauling.

*For capacities of 30 tons or more where maximum flotation is required, a full line of tandem rear axle Macks is available.*

CONDENSED SPECIFICATIONS

**ADS:** Rear dumper, 15 tons.

**L ENGINES:** 172 h.p., naturally- Mack Thermodyne; 220 h.p., nat- spirated Cummins; 205 h.p., turbo- Mack Thermodyne.

**MISSION:** Mack, selective, constant 10 speeds forward, 2 reverse.

**CHES:** Mack single-plate, 253 sq. in. ment (for 170 h.p. Mack Thermodyne); wo-plate, 416 sq. in. engagement for izes.

**T AXLE:** Mack, heavy-duty, drop- -beam.

**AXLE:** Mack Planidrive, with final re- through planetary gear train within wheel hubs.

**BRAKES:** Full air, with 12 cu. ft. compressor.

**FRAME:** Wide flange, rolled section I-beam.

**SPRINGS:** Front, semi-elliptic with Rubber Shock Insulator suspension; rear, progressive-rate semi-elliptic with cam face slipper ends and radius rod.

**TIRES:** Front, 12.00-24 (16P) rib, 13.00-24 (18P) rib; rear, 14.00-24 (18P) lug, 16.00-25 (20P) lug.

**WHEELS:** Cast, spoke.

**STEERING:** 60' turning circle diameter.

**DUMP HOIST:** Twin, double-acting, 8" cylinders providing 70° dumping angle.

For more facts, see next page →

## Avoid legal pitfalls

### Mistake in bid justified withdrawal

THE PROBLEM: *A contractor's bid on storm-sewer conduit construction on a Baltimore expressway was $1,769,-064.25, more than $500,000 less than it would have been except for his engineer's mistake in transcribing figures from work sheets to a summary sheet on which the bid was based. In calculating the cost of unclassified excavation, the estimated yardage was divided into estimated dollar cost to obtain a unit cost of $13.34 per yard. In transcribing figures from the work sheets to the summary sheet, that figure was stated as $3.34. After the bids were opened, but before acceptance, the mistake was discovered and the contractor unsuccessfully sought to induce the city of Baltimore, which had called for bids, to permit either correction or withdrawal of the bid. The $500,000 mistake was to be compared with the bidding company's net worth of less than $100,000. (1) Was the company entitled to correct its bid? (2) If not, was it entitled to withdraw the bid, and was it entitled to a return of the bid deposit?*

THE ANSWERS: (1) No. (2) Yes. (City of Baltimore v. DeLuca-Davis Construction Co., 124 Atl. 2d 557, decided by the Maryland Court of Appeals.)

The opinion is noteworthy because it summarizes conclusions that have been reached by many appellate courts on various legal aspects involved in such controversies.

In such a case, the bidder is not entitled to have his bid corrected and the owner held liable for the correct amount. This is so, first, because the mistake was not mutual. Here, the city was in no way a party of the mistake. In the second place, a court cannot write for two parties a contract on terms to which they have not mutually agreed.

But right to withdraw the bid rests upon different considerations. If the contractor had bid on a private job, the court said that right to withdraw would have been clear. No different rule should apply to public contracts in similar circumstances.

The fact that the governing body of a municipality or other public authority ought to have suspected that a mistake had been made, because of much larger sums bid by other bidders, is one factor that has led courts to permit withdrawal of a bid.

Generally, withdrawal is permitted if (1) it would be unconscionable to hold the bidder to his mistake; (2) if the mistake involves a major feature of the proposed contract; (3) if the mistake does not involve "culpable negligence" or "violation of a positive legal duty"; and (4) if the owner will not be seriously prejudiced by withdrawal of the bid, other than loss of the bargain that the mistake would give him.

When, as in this case, the contracting authority's attention has been drawn to the mistake before acceptance of the bid, the courts have almost unanimously permitted withdrawal of the bid. But the court notes that in Massachusetts it has been decided that there must be mutual mistake to justify cancellation of the bid.

The Maryland court says that withdrawal in a case of this kind is permissible, even though a city charter provision declares that all bids shall be irrevocable.

The court concluded that the contractor was entitled to withdraw the bid and to the return of the bid deposit, whether or not the city should elect to reject all bids and readvertise or award the contract to the next lowest, responsible bidder.

### Equipment leases

THE PROBLEM: *Allegedly, a lessor furnished defective hoisting equipment and an incompetent operator who negligently operated it while plaintiff, an employee of the lessee, was repairing the equipment. Plaintiff sued the lessor and the operator. The lease bound the lessee to protect the lessor against "liability for any property damage and personal injury caused directly or indirectly by the leased agreement and materials while under the control and custody of the lessee".*

*Was the lessor entitled to file a*

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**Edited by A. L. H. STREET**
**Attorney-at-Law**

*These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.*

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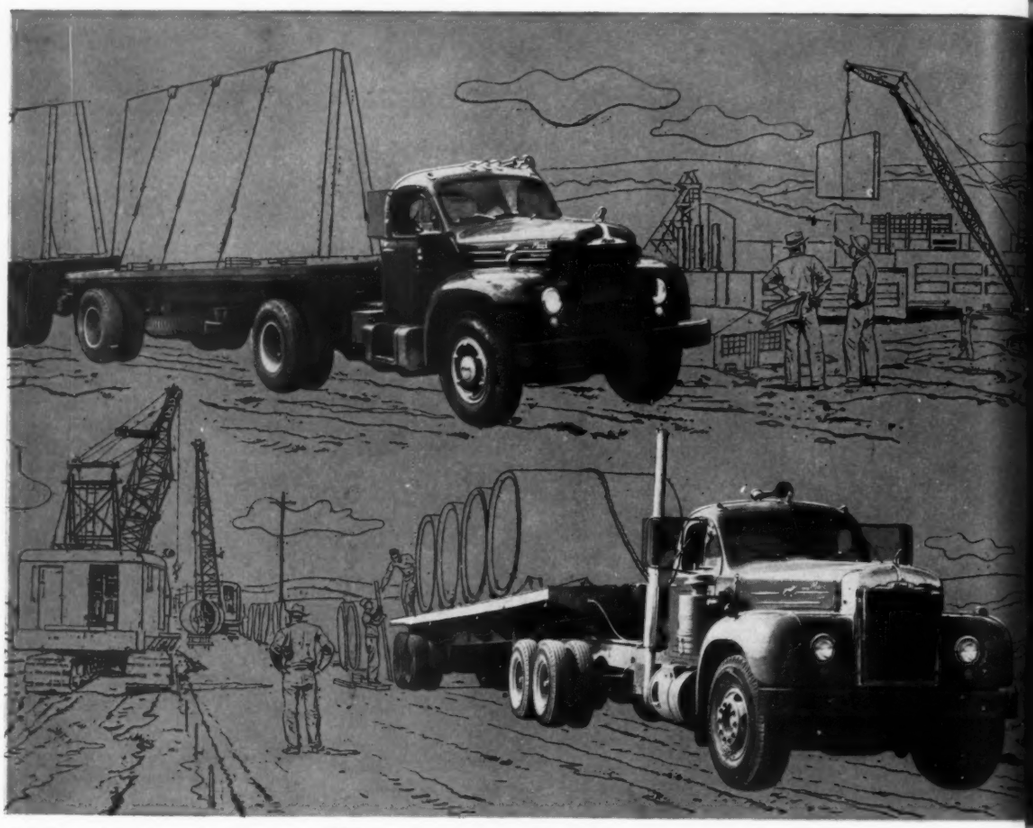
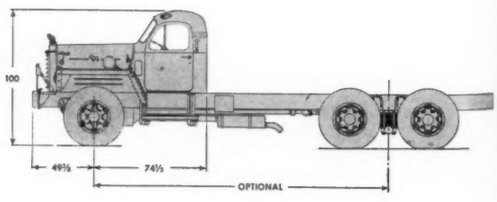


MACKS FOR EVERY ON

MACK B-80 SERIES

B-80 tractors for heavy-duty flat bed and dump trailer hauling, and B-80 truck chassis for large capacity dumper, mixer, and stake body operations have run up an unequaled record for economy and dependable service in all phases of construction work. Available in four- and six-wheel models including six-wheel drive models, B-80's are powered with 170 to 232 horsepower Mack Thermodyne gasoline or diesel engines, or with Cummins diesels in the 220 to 320 horsepower class.




CONDENSED SPECIFICATIONS

**PAYLOADS:** Rear dumper, 6 to 12 cubic yards; mixer, 7½ to 8½ cubic yards (6-wheelers) ( larger with special provision).

**ENGINES:** Gasoline: Mack Thermodyne, 232 h.p. Diesel: Mack Thermodyne, 170 h.p.; 205 h.p., with turbocharger. Cummins, 220 h.p.; 320 h.p., with supercharger.

**TRANSMISSIONS:** Mack: Five-speed, direct or overgear. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Five-speed and auxiliary, with or without tower power take-off. Availability contingent upon chassis models.

**FRONT AXLE:** Mack, heavy-duty, drop-forged I-beam. Mack, front wheel drive, for 6x6 chassis.

**REAR AXLES:** Four-wheelers: Mack Dual R duction, with radius rods and torque arm Six-wheelers: Mack Balanced Bogie, Dual R duction, through-drive, interaxle Mack Pr Divider.

**FRAME:** Channel: Alloy-steel, heat-treat channel reinforcement, standard.

**TIRES:** Available sizes and types: 11.00-12.00-24 (Four-wheeler); 11.00-22, 11.00-12.00-24 (Six-wheeler). Size availability c tingent upon bogie.

**STEERING:** Hydraulic-power steering (Op tional extra).

*cross-complaint against the lessee, claiming that the latter was in control of the equipment, that plaintiff was the lessee's employee at the time of the accident, and that, if the lessor was liable to plaintiff, lessor was entitled to reimbursement by the lessee because (1) of the above quoted clause of the lease, because (2) of negligence of the lessee in operating the hoist—particularly in using it to haul passengers, and because (3) of negligence in attempting to repair the hoist?*

THE ANSWER: Yes. (Bernardo v. Fordham Hoisting Equipment Co. 170 N. Y. Supp. 2d 139, decided by the New York Supreme Court, Special Term, Bronx County.)

The decision was a pretrial determination that if the lessor should be held liable to plaintiff and should prove his cross-claim against the lessee, he would be entitled to reimbursement. The court said that the lessor would be so entitled even if it should be proved that the hoist was in defective condition when leased, because of the special agreement by the lessee to indemnify the lessor against liability to third parties.

The court said that although the clause did not explicitly require the lessee to indemnify the lessor for liability to third persons for the lessor's own negligence, it circumstantially appeared that it was intended that the lessor be relieved of such liability—as between the parties to the lease—for any defects in the equipment. This was reasonable because the lessee would be in exclusive control of the hoist while it was being used.

## Suppliers' rights on federal jobs

THE PROBLEM: *An electrical supply company furnished materials to a subcontractor on a federal construction job. The prime contractor had given bond to protect "all persons supplying labor and materials in the prosecution of the work", as required by the Miller Act. Assuming that the supply company gave the prime contractor the notice also required by the Act and furnished supplies and materials of the kind required by the prime contract, was the company protected by the bond, even if the subcontractor did not actually use the supplies and materials on the particular job?*

THE ANSWER: Yes. (United States v. Bergman Construction Co., 156 Fed. Supp. 784, decided by the United States District Court, Eastern District of New York.)

The court also decided that the supplier was not bound to prove that any money remained due the subcontractor in the hands of the prime contractor. In short, it was up to the prime contractor to assure itself, before it paid the subcontractor, that the latter had paid for materials used or usable in performance of the subcontract.

## Was truck "upset"?

THE PROBLEM: *A ten-wheel dump truck was insured against damage due "to collision or upset". To dump fill material, it was necessary to back the truck over previous fill. When the bed was hoisted halfway, the earth beneath the rear wheel gave way, causing the right wheel to sink to within 2 or 3 inches of the axle. Shifting weight of the load broke the bed frame and caused other damage. Did the insurance cover the loss?*

THE ANSWER: Yes. (Espree v. Western Pioneer Insurance Co., 324 Pac. 2d 749, decided by the California Superior Court, Alameda County, Appellate Division.)

## Delay damages upheld

THE PROBLEM: *A county let a contract for drainage ditch construction alongside a secondary highway and for the replacement of a bridge with concrete construction. The contractor was to pay $40 per day as damages for delayed performance after a fixed date. Considering the public interest in using the road and the impossibility of precisely estimating damages, was the provision valid?*

THE ANSWER: Yes. (Korshoj Construction Co. v. Mills County, Iowa, 156 Fed. Supp. 138, decided by the United States District Court, Southern District of Iowa.)

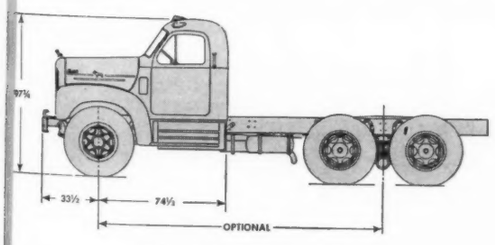
## Inharmonious plans, contracts, specifications

As typical examples of common causes of litigation in the construction field, we cite the following cases decided by appellate courts:

If discrepancy exists between plans, made part of a contract, and the provisions of the contract itself, the latter are controlling. In determining whether there is a valid contract, specifications will be so interpreted, if possible, as to conform to the contract. (Oberg v. City of Los

ONSTRUCTION JOB

aggregate and materials hauling




CONDENSED SPECIFICATIONS

OADS: Rear dump, 6 to 12 cubic yards; 5½ to 7½ cubic yards (6-wheelers).

NES: Gasoline: Mack Thermodyne, 185 Diesel: Mack Thermodyne, 170 h.p.; p. with turbocharger.

SMISSIONS: Mack: Five-speed, direct. eed (two-lever) Duplex. Twenty-speed plex. Ten- and twenty-speeds both and "Off" Highway types. Five-speed xiliary, with or without tower power ff; ten-speed and auxiliary. Availability ent upon chassis models.

T AXLES: Mack, heavy-duty, drop- I-beam. Three available sizes.

REAR AXLES: Four-wheelers: Mack Dual Reduction—with radius rods and torque arms. Six-wheelers: Mack Balanced Bogie, Dual Reduction, through-drive, interaxle Mack Power Divider. Three bogie sizes available.

FRAME: Channel: Alloy-steel, heat-treated, pressed; channel reinforcements for maximum services (standard or optional extra).

TIRES: Available sizes and types: 11.00-24, 12.00-24 (Four-wheeler). 10.00-20, 10.00-22, 11.00-20, 11.00-22, 11.00-24 (Six-wheeler). Size availability contingent upon bogies required.

STEERING: Hydraulic-power type (optional extra).

MACK B-60 SERIES

As dumpers, mixers, tractors, and flat-bed trucks, Mack B-60's are the acknowledged workhorses of contractors everywhere because of their dependable and efficient performance for a wide range of jobs. They are powered with Mack Thermodyne gasoline or diesel engines in either the 170 or 205 horsepower range. Both four- and six-wheel units are available. Six-wheel models use the exclusive Mack Balanced Bogie with interaxle Power Divider, the sure-footed drive that directs power more to the wheels having the greater traction.


For more facts, see next page →

## avoid legal pitfalls

Angeles, 281 Pac. 2d 591, decided by the California District Court of Appeal.)

"Specifications" ordinarily signify a detailed description of the structure to be built, including manner of construction and materials to be used. (Brooks v. Smith, 269 S. W. 2d 259, decided by the Kentucky Court of Appeals.)

A subcontract, "as per plans and specifications", must be read in the light of both. (Brown v. Poston, 269 Pac. 2d 967, decided by the Washington Supreme Court.) But in a Minnesota case a dispute under an electrical subcontract requiring work to be done "as per plans and specifications" was decided in the subcontractor's favor. The prime contract building specifications required backfilling and grading in general, but the specifications covering ducts for electric wiring did not provide for refilling the trenches excavated for the ducts. The subcontractor was not bound to do the refilling. (Sagi v. Hirt, 52 N. W. 2d 721.)

Reference in a contract to certain plans as being a part of the contract has the same effect as if the plans had been embodied in the contract. (Gaybis v. Palm, 93 Atl. 2d, decided by the Maryland Court of Appeals, and Staley v. New, 250 Pac. 2d 893, decided by the New Mexico Supreme Court.)

A subcontractor's agreement to do part of work called for by the prime contract and covered by plans and specifications makes those plans and specifications a part of the subcontract. (Vappi & Co. v. Sullivan, 120 N. E. 2d 203, decided by the Massachusetts Supreme Judicial Court.) To the same effect is a decision by the Michigan Supreme Court. (Arrow Sheet Metal Works v. Bryant & Detwiler Co., 61 N. W. 2d 125.)

### Computing damages for incomplete work

THE PROBLEM: *A contractor who built a manufacturing plant failed to provide for surface drainage and to construct a cesspool called for by the contract. The contractor sued for a balance due on the contract price, and the owner counterclaimed for the cost—more than four years after the work was accepted—of supplying the drainage and cesspool. Was the counterclaim valid?*

THE ANSWER: No. (Gaylord Builders, Inc., v. Richmond Metal Manufacturing Corp., 149 Atl. 2d 358, decided by the Pennsylvania Superior Court.)

The court said that the general rule of law, whereby an owner can hold a contractor liable for the reasonable cost of doing work which the latter agreed to but did not do, means labor and material costs prevailing at the time of the breach of contract. Proof of costs in January, 1957, did not show a basis for assessing damages for a breach that had occurred in 1952.

### Contractor's conviction void on fraud charge

THE PROBLEM: *A New York contractor was convicted of first degree larceny on evidence that he had misapplied money received from an owner. The trial judge, over the defendant's objections, received evidence showing that the defendant had abandoned another job with another person, leaving lienable claims against the property, and had bought an automobile for his son-in-law.*

*Even if there was enough evidence to prove that the defendant was guilty of the particular charge, was the conviction void because the trial judge permitted the jury to consider the other transaction, without evidence that funds had been misapplied in the other case or evidence tending to show a general scheme by the defendant to defraud his patrons?*

THE ANSWER: Yes. (People v. Dobecki, 147 N. E. 2d 478, decided by the New York Court of Appeals.)

### Machine owner not liable

THE PROBLEM: *The owner of a bulldozer agreed to grade a site, furnishing an operator. The operator showed the landowner how to operate the machine. The landowner was injured when ground gave way at a bank and the brakes failed to stop the bulldozer. Was the owner of the machine liable?*

THE ANSWER: No. (Fortner v. Deitz, 102 S. E. 2d 423, decided by the North Carolina Supreme Court.)

The court said that the accident must be attributed to the plaintiff's own carelessness in attempting to operate a machine without previous experience. There was no proof that the owner of the bulldozer had been negligent, though he might be charged with the operator's act in permitting the plaintiff to operate the machine.

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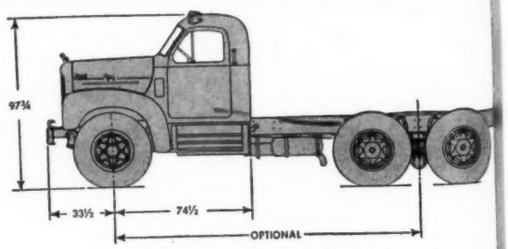


CONDENSED SPECIFICATIONS

**PAYLOADS:** Rear dumper, 5 to 10 cubic yards; mixer, 5½ to 6 cubic yards (6-wheeler).

**ENGINES:** Gasoline: Mack Magnadyne, 150 h.p. Diesel: Mack Thermodyne, 150 h.p.

**TRANSMISSIONS:** Mack: Five-speed, direct. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Ten- and twenty-speeds, both "On" and "Off" Highway types. Five-speed and auxiliary, with or without tower power take-off. Availability contingent upon chassis models.

**FRONT AXLES:** Mack, heavy-duty, drop-forged I-beam. Four sizes. Mack, front-wheel drive (for 6x6 chassis).

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**STEERING:** Hydraulic power steering tional extra).

Illustrations are not necessarily representative of standard specifications.

## Convention calendar

**October 13–18 American Society of Civil Engineers**
Annual Convention, Statler-Hilton Hotel, New York City. Don P. Reynolds, assistant to the secretary, ASCE, 33 W. 39th St., New York, N. Y.

**October 14–15 Wire Reinforcement Institute**
Annual Fall Meeting, Park Plaza Hotel, St. Louis, Mo. Frank B. Brown, managing director, WRI, National Press Bldg., Washington 4, D. C.

**October 15–18 American Bridge, Tunnel and Turnpike Association**
Annual Meeting, Hotel John Marshall, Richmond, Va. J. Allyn Stearns, executive secretary, ABTTA, P. O. Box 148, White Plains, N. Y.

**October 20–21 National Association of Corrosion Engineers**
Annual Conference and Exhibition of South Central Region, Roosevelt Hotel, New Orleans, La. T. J. Hull, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

**October 20–24 National Safety Council**
Forty-sixth Safety Congress and Exposition, Conrad Hilton Hotel, Chicago, Ill. R. L. Forney, secretary, NSC, 425 N. Michigan Ave., Chicago 11, Ill.

**October 21–22 National Slag Association**
Forty-first Annual Meeting, Mayflower Hotel, Washington, D. C. NSA, 613 Perpetual Bldg., Washington 4, D. C.

**October 23–24 Virginia Highway Conference**
Conference, Virginia Military Institute, Jackson Hall, Lexington, Va. R. P. Ellison, executive assistant, VHC, 1221 E. Broad St., Richmond 19, Va.

**October 23–25 National Society of Professional Engineers**
Fall Meeting, St. Francis Hotel, San Francisco, Calif. J. A. Sontheimer, secretary, California Society of Professional Engineers, c/o St. Francis Hotel, San Francisco, Calif.

**October 26–31 International Road Federation**
Third World Meeting, Scop Bldg., Mexico City, Mexico. Robert O. Swain, executive director, IRF, 1023 Washington Bldg., Washington 5, D. C.

**October 27–29 National Lubricating Grease Institute**
Annual Meeting, Edgewater Beach Hotel, Chicago, Ill. T. W. H. Miller, executive secretary, NLGI, 4638 Nichols Parkway, Kansas City, Mo.

**October 27–30 American Institute of Steel Construction**
Annual Convention, Greenbrier Hotel, White Sulphur Springs, W. Va. L. Abbett Post, executive vice president, AISC, 101 Park Ave., New York, N. Y.

**November 12 Cleveland Engineering Society**
Construction Conference, Engineering and Scientific Center, Cleveland, Ohio. CES, 3100 Chester Ave., Cleveland, Ohio.

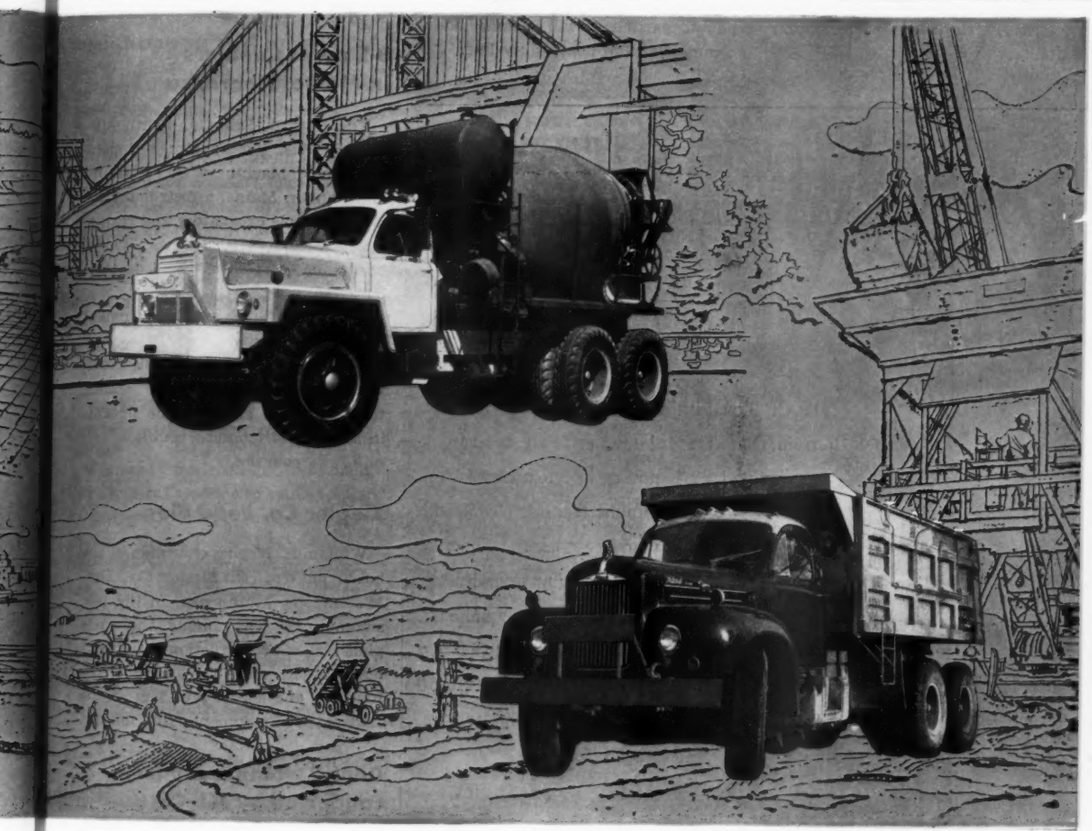
**November 20–21 Electronic Computation Conference**
Conference, sponsored by Kansas City Section of the American Society of Civil Engineers and the Structural Division of ASCE, Continental Hotel, Kansas City, Mo. Steven J. Fenves, secretary, ECC, Civil Engineering Hall, University of Illinois, Urbana, Ill.

**November 20–21 Mississippi Valley Flood Control Association**
Meeting, Hotel Roosevelt, New Orleans, La. R. W. Crawford, executive vice president, MVFCA, 203 Peabody Hotel, Memphis 3, Tenn.

**November 30–December 5 American Society of Mechanical Engineers**
Annual Meeting, Statler and Sheraton-McAlpin Hotels, New York, N. Y. ASME, 29 W. 39th St., New York 18, N. Y.

**December 1–5 American Association of State Highway Officials**
Forty-fourth Annual Meeting, Sheraton-Palace Hotel, San Francisco, Calif. A. E. Johnson, executive secretary, AASHO, 917 National Press Bldg., Washington 4, D. C.

**December 10–11 National Construction Industry Conference**
Fourth Annual Meeting, Sherman Hotel, Chicago, Ill. R. T. Majanovich, conference chairman, NCIC, Armour Research Foundation, 10 W. 35th St., Chicago 16, Ill.

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***A truck or tractor for every construction job.*** Dumpers, concrete mixers, tractors, flat-bed trucks—there are dependable, economical Macks for every important construction task . . . right up to the biggest. Moreover, when you standardize on Macks, you gain the added savings of a completely integrated parts and upkeep operation.

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## Soil-cement is topic of new PCA booklet

An 11-page illustrated booklet, "Essentials of Soil-Cement", has been released by the Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill. Summarizing the history, uses, and basic construction steps of this type of paving, the booklet discusses what soil-cement is; its development, use, and engineering properties; how it is built; control factors for soil-cement construction; and the necessary steps for proper inspection and field control. Further information about the booklet may be obtained by writing to the association.

## Two scale companies combine operations

The Cardinal Scale Mfg. Co., Webb City, Mo., and the L. R. Murphy Scale Co., Sacramento, Calif., have formed an association to manufacture scales. They will use the design, patents, and features of welded-steel construction in heavy-duty industrial and vehicle scales pioneered by the Murphy firm.

A complete line of scales—industrial, built-in, motor truck, contractors' portable motor truck, tank, hopper, and railway track—will be manufactured and assembled at the Cardinal plant for distribution in the Midwest and East. The scales will be marketed under the name of Murphy-Cardinal.

*A section featuring winter construction starts on page 28 of this issue.*

## Distributor doings

### Warner & Swasey dealers

The Warner & Swasey Co., Cleveland, has named 13 dealers to handle the Hopto line of earthmoving machinery. The distributors are Arnold Machinery Co., Salt Lake City, Utah, and Boise, Idaho; Behrenwald Equipment Sales, Lakeview, Mich.; Caldweld, Inc., Los Angeles, Calif.; Eddy Equipment Co., Buffalo, N. Y.; R. C. Hazelton Co., Inc., Manchester, N. H.; and Hawaiian Equipment Co., Honolulu, Hawaii.

The others are Interstate Equipment Co., Statesville and Raleigh, N. C.; National Machinery Co., Ltd., Vancouver, B. C., Canada; Prefontaine Machinery & Equipment, Ltd., Jacques Cartier, Que., Canada; Thalman Equipment, Inc., New York, N. Y.; Tractor & Equipment Co., Oaklawn, Ill.; Twin City Industrial Equipment Ltd., Port Arthur, Ont., Canada; and West Coast Engine & Equipment Co., Berkeley, Calif.

### Koehring-Johnson mixers handled by Seattle firm

The C. S. Johnson Co., Champaign, Ill., a subsidiary of Koehring Co., has named A. H. Cox & Co., 1757 First Ave. S., Seattle, a distributor for Koehring-Johnson construction mixers in northwestern Washington State.

### Dorsey Trailers names three new dealers

Dorsey Trailers, Inc., Elba, Ala., has appointed two Rocky Mountain distributors for its complete line of trailers and bodies. McVey's, Inc., 161 Third Ave. W., Twin Falls, Idaho, offers complete maintenance and repair of the equipment. This dealer has a branch at Hazelton, Idaho.

Titan Dorsey Trailer Sales & Service, Inc., 1363 Major St., Salt Lake City, Utah, also offers complete trailer and truck body repair and overhaul.

C. I. T. I. M., Caracas, Venezuela, has been appointed a dealer by Dorsey. The new distributor, which maintains a complete service and repair department, will handle both commercial and heavy-duty lines.

### Chrysler engine division appoints four dealers

The Chrysler Marine and Industrial Engine Division, Chrysler Corp., Detroit, has appointed four new dealers for its line of industrial engines. Serving their respective cities are Martin Motor Co., P. O. Box 1568, Springfield, Mo.; The Auto & Aero Supply Co., Inc., 1711 Race St., Cincinnati, Ohio; Delta Irrigation Co., 1267 E. Severson, Memphis, Tenn.; and Stewart & Stevenson Services, Inc., 5170 Pt. Arthur Rd., Beaumont, Texas. The Wilson Engine & Equipment Co., formerly at Bakersfield, Calif., has moved to 5390 Mission Blvd., Ontario, Calif.

### B-E names dealers in Maine, Nebraska

The Bucyrus-Erie Co., South Milwaukee, Wis., has appointed Houghton-Arnold Machinery Co., Portland and Bangor, Maine, a distributor for its convertible excavators and cranes, transit cranes, Hydrocranes, Hydrohoes and Hydroshovels, and dragline buckets.

Construction Service Equipment Co. of Omaha and North Platte will offer sales and service on B-E's convertible excavators and cranes, transit cranes, and dragline buckets in all but 11 Nebraska counties, and in 9 Iowa counties.

### Ziegler Co. head dies

William H. Ziegler, chairman of the board of Wm. H. Ziegler Co., Inc., Minneapolis, Minn., died in the late summer. He was among the early pioneers of construction-machinery distribution, and was one of the founders and a past president of the Associated Equipment Distributors.

### Dealer training program conducted by J. I. Case

Over 500 dealers of Utility equipment, manufactured by J. I. Case Co., Racine, Wis., are now able to offer a more constructive service to contractors, local governments, and others who work with tractor loaders, dozers, backhoes, and various power equipment. The new service results from special "how to" meetings being conducted at local distributorships across the nation by William Vogel, assistant sales manager of the firm's Utility Sales Division, with the assistance and participation of local Case branch personnel.

The training sessions—which are half discussion and half field work—cover a wide range of subjects.

### U. S. Rubber appoints

Champion, Inc., Iron Mountain, Mich., has been named a distributor of industrial rubber products manufactured by U. S. Rubber Co., New York City. The dealer, which is also a gravel supplier and contractor, will distribute conveyor and transmission belting, rod and sheet packing, hose, and other industrial products in the northern Michigan peninsula area.


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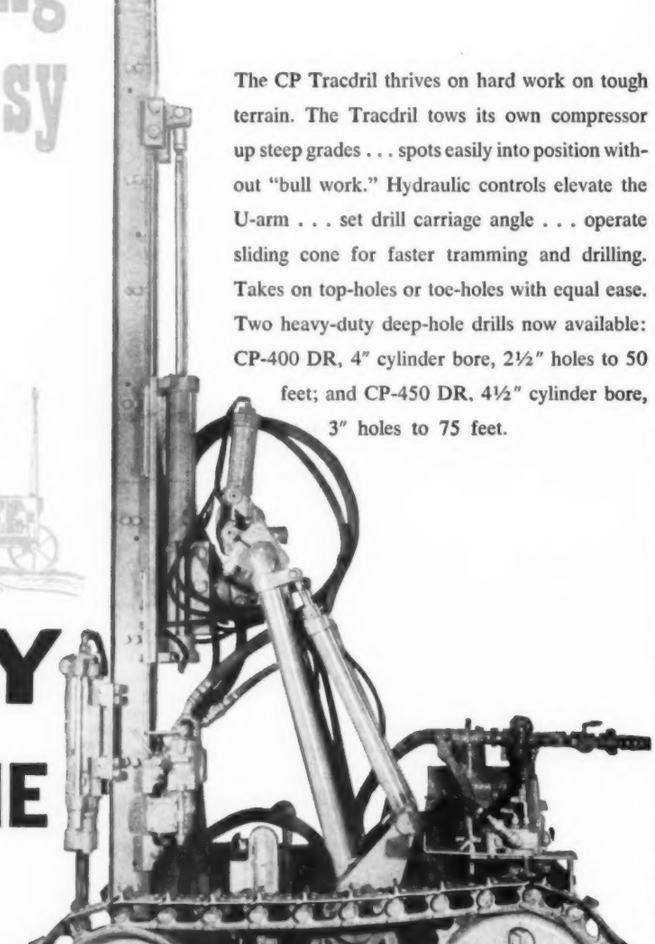
The CP Tracdril thrives on hard work on tough terrain. The Tracdril tows its own compressor up steep grades . . . spots easily into position without "bull work." Hydraulic controls elevate the U-arm . . . set drill carriage angle . . . operate sliding cone for faster tramming and drilling. Takes on top-holes or toe-holes with equal ease. Two heavy-duty deep-hole drills now available: CP-400 DR, 4" cylinder bore, 2½" holes to 50 feet; and CP-450 DR, 4½" cylinder bore, 3" holes to 75 feet.

TODAY IT'S THE CP TRACDRIL



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For more facts, use Request Card at page 18 and circle No. 213

## Madsen Works dealer

Madsen Works, Baldwin-Lima-Hamilton Corp., Construction Equipment Division, La Mirada, Calif., has appointed a new distributor to handle sales and parts service for Madsen asphalt plants and equipment. Interstate Equipment Co., Salisbury Road, Statesville, N. C., is the exclusive distributor for that state.

## Gardner-Denver names

Spreitzer, Inc., of Cedar Rapids, Iowa, and Peoria, Ill., is a new dealer in both states for the Gardner-Denver Co., Quincy, Ill.

## Euclid appoints dealer

Northern California Euclid, Inc., Clay and Soule Sts., Sacramento, Calif., has been appointed dealer for the complete line of Euclid scrapers, rear-dump and bottom-dump haulers, and crawler tractors, by the Euclid Division of General Motors Corp., Cleveland, Ohio. The dealer's territory consists of counties north of and including Monterey, Kings, Tulare, and Inyo, except Plumas, Sierra, Nevada, Placer, and El Dorado.

## Western Construction names sales managers

Western Construction Equipment Co., Billings, Mont., has named Jack L. Patterson sales manager of the Billings division for the complete line of heavy-construction machinery handled by the firm. His territory includes the southern half of Montana and northern Wyoming. Harold B. Wright has been promoted to sales manager of the Great Falls division, covering the north half of Montana.

## Worthington names Lembo

Worthington Corp., Harrison, N. J., has appointed the J. C. Lembo Machine Corp., Corona, N. Y., as a sales service and rental distributor for its construction machinery. Formerly known as Jaeger-Lembo Machine Corp., the firm maintains a branch office in Huntington, N. Y. Lembo distributes Worthington truck mixers, pavers, contractors' pumps, tools, and mobile drills, and portable rotary compressors in 14 New York State counties in the metropolitan area.

## Clark dealer changes

The Construction Machinery Division, Clark Equipment Co., Benton Harbor, Mich., has made three changes in distributorships. Merts Equipment Co., with offices in Albany and Savannah, Ga., is now authorized to sell and service Michigan tractor shovels, tractor-dozers, tractor-scrapers, tractor loggers, and excavator cranes in six additional Georgia counties.

Stith Equipment Co., Atlanta, now services the Georgia county of Whitfield; and Spreitzer, Inc., Cedar Rapids, Iowa, has established a branch office at 3527 W. Farmington Road, Peoria, Ill.

## California dealer moves

Action Equipment Co. has moved to 4000 N. Wilson Way, Stockton, Calif. The dealer carries Koehring, Parsons, Kwik-Mix equipment; BMCO rollers; and Yuan buckets.

## LeT-WesCo names dealer

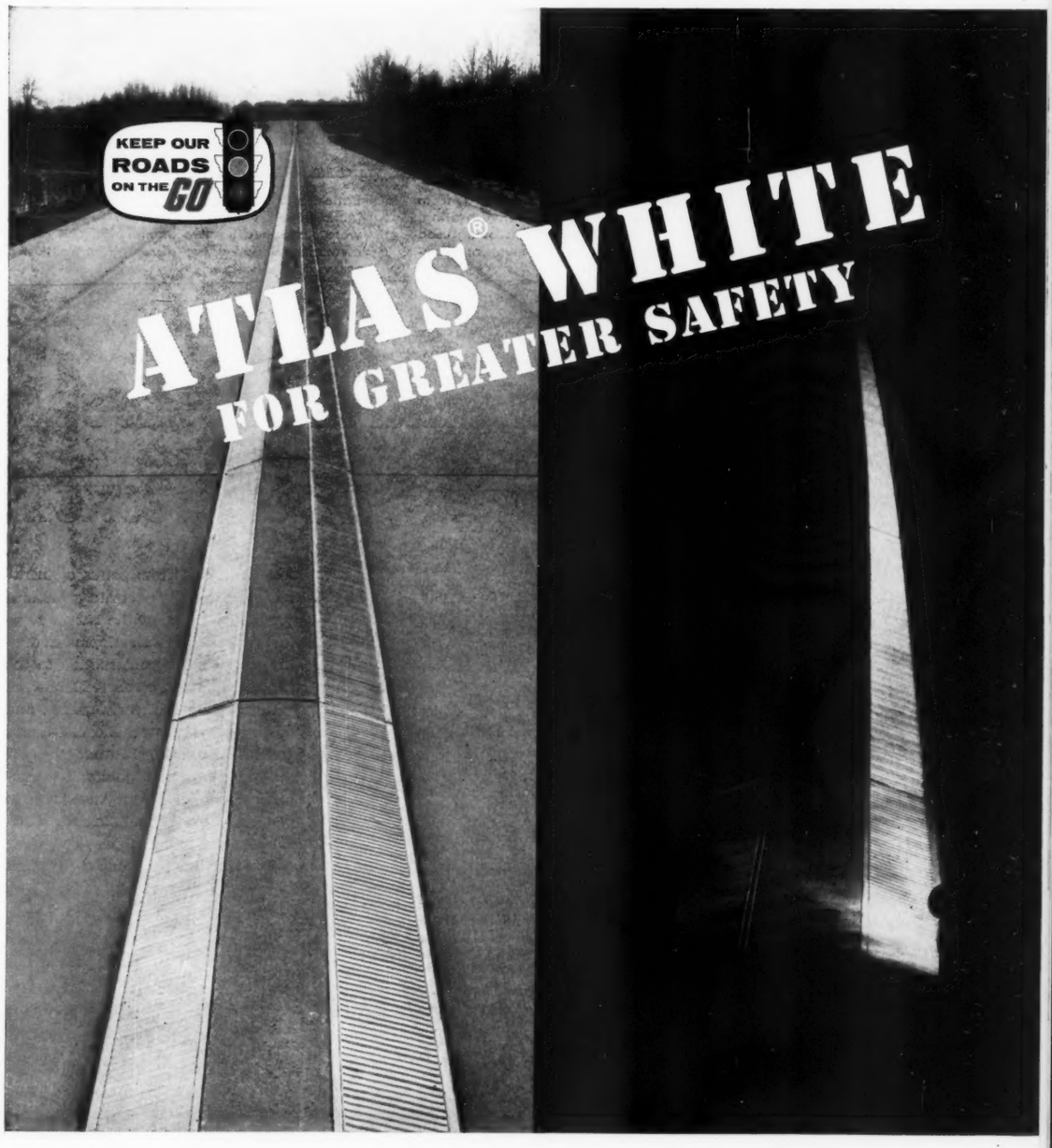
Ackerman Chacco Co., Inc., 9500 Kenwood Road, Cincinnati, Ohio, has been appointed a distributor for the complete line of earthmoving, hauling, and grading equipment manufactured by the LeTourneau-Westinghouse Co., Peoria, Ill. The dealer will sell and service LeT-WesCo equipment in 15 Ohio counties, 5 Indiana counties, and 3 Kentucky counties.

## Two new Trojan dealers

The Yale & Towne Mfg. Co., Contractors Machinery Division, Batavia, N. Y., has appointed two new distributors for the Trojan tractor-shovel line. Scott Machinery, Inc., U. S. 3, Concord, N. H., will cover that state. Sierra Machinery Co., Inc., 307 Morrill Ave., Reno, Nev., will serve the northern part of the state and three counties in California.

## Davey names distributor

Davey Compressor Co., Kent, Ohio, has appointed the Cactus Equipment Co., 2310 Calhoun, Houston, Texas, as distributor for its complete line of compressors; rotary drills; and contractors' air tools.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- At night, saw-toothed surfaces reflect headlight rays back to driver. On rainy nights, the wet curb surfaces become even more reflective.

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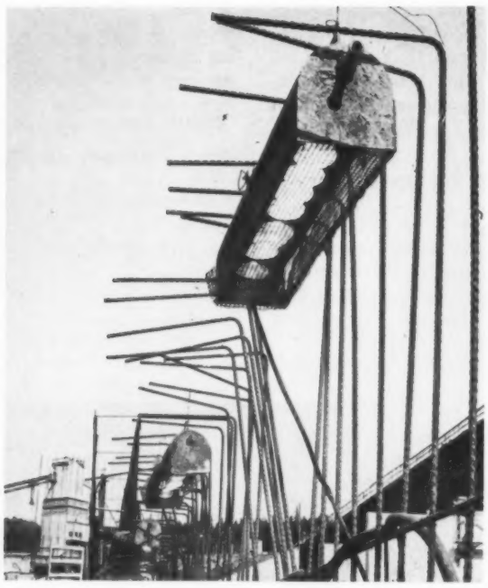
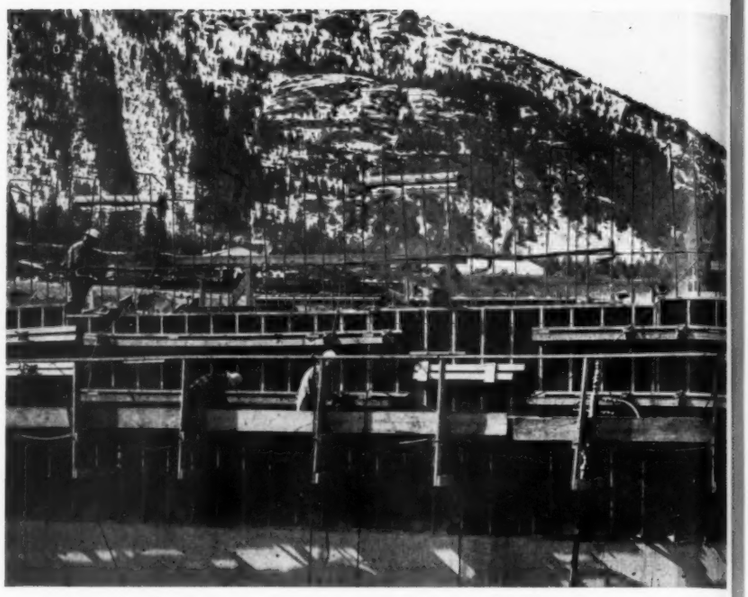


One-thousand-watt infrared heat lamps, suspended from the reinforcing rods in a steel shield with protective grating, supply enough heat to warm concrete and forms being used on the Noxon Rapids Hydroelectric Development on Montana's Clark Fork River.



Batteries of the lamps, hung from reinforcing steel, are used to heat horizontal construction joints in structural concrete even through the coldest months. Though mass concrete pours were suspended for two months, lamps were used during concrete work on small structural elements. Workmen are removing forms that had been left in place to serve as insulation for vertical surfaces.

# Lamps heat concrete to keep work moving at Noxon Rapids Dam

by RALPH MONSON, field editor

Radiant heat from banks of infrared lamps warmed certain structural concrete sections of the Noxon Rapids Hydroelectric Development during cold-weather construction in the far northwestern corner of Montana.

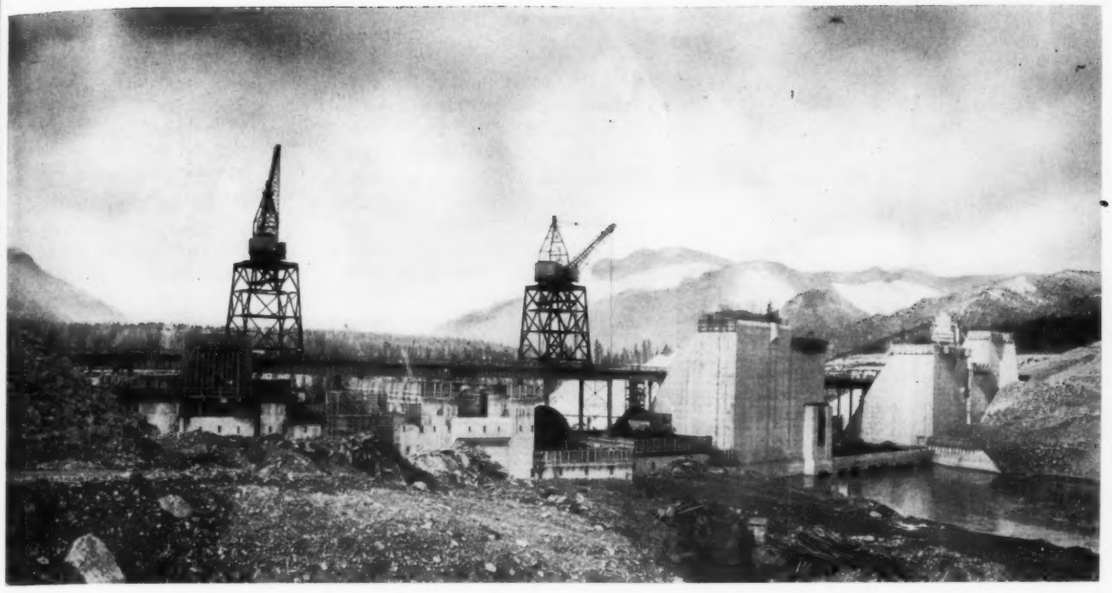
During late fall, early spring, and much of the winter, the contractor used this method of heating the horizontal construction joints in structural concrete. Forms were left in place to provide insulation for vertical concrete surfaces.

The heat lamps, grouped in banks of about ten, were suspended above newly placed concrete. To prevent concrete from drying under the heat, the contractor kept an inch or more of water on the surface. The radiant heat penetrated the cold air and water to be absorbed by the concrete. Concrete at the construction joints did not require covering or additional heat or protection, except during the most severe weather.

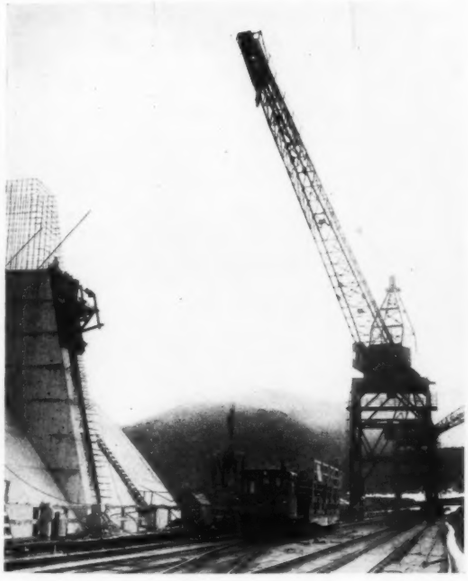
With an average of 40,000 cubic yards of concrete placed per month

(*Continued on page 30*)

Snow still clings to mountaintops in early March, when mass concrete pours are resumed. Concrete is being handled by two Washington revolving cranes —35-ton units mounted on 60-foot gantries and fitted with 150-foot booms. They are working from a 938-foot-long construction trestle. The Manitowoc 4500 dragline is removing a section of the cofferdam.

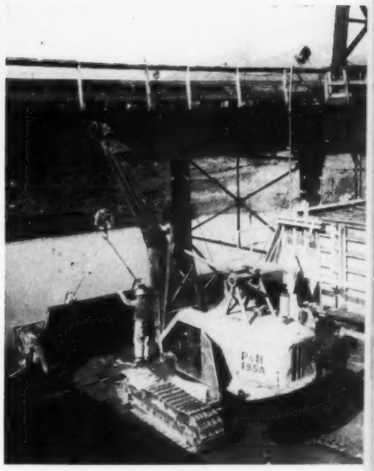


An upstream view of the dam, with the gantries at work. Water is being carried through the sluices at right. By next spring, high water will be taken over the spillway crest.



Despite cold weather and occasional March snowstorms, concrete is delivered to a gantry by a flatcar that has two full buckets and space for an empty. Concrete is being placed almost under the trestle in the intake section.

Aggregates leave the rescreen and wash house, right, for the C. S. Johnson batch plant. The mix is dumped into Gar-Bro 4-yard buckets carried on flatcars pulled by Goodwin 25-ton diesel locomotives.



A little P&H 155A hoe, fitted with a hook, handles forms on the main dam monoliths. The rig will be picked up by the gantry and moved from one monolith to another to strip forms, leaving the cranes free to place concrete.

The first winter, low temperatures, heavy snows, and ice complicated construction of spillways in the first-stage cofferdam. At extreme left, a service bridge is under construction. At center, a Washington revolving gantry crane works on the spillway. In background is the C. S. Johnson concrete plant.

A Manitowoc 4500 dragline starts removing the cofferdam that enclosed the intake section and powerhouse during the early stages of work. The intake dam was built up so that it could not be overtopped by 1958 high water, which was carried through sluices and low blocks of the spillway.

(*Continued from page 28*)

during the active part of the construction season, general contractor Morrison-Knudsen Co., Inc., Noxon, Mont., had the job far enough ahead of schedule so that large-scale placements were not required during the coldest weather. This made it convenient to place some of the smaller structural elements during the best days of winter, providing enough work to keep the carpenter foremen and mixing crews busy.

When mass placements in the dam monoliths were resumed this spring, it was sometimes necessary to cover the exposed surfaces of the concrete and to use the heat lamps. They were not used to heat mass pours, but they were used to maintain heat in penstocks and other items being embedded until the concrete was placed.

#### Concrete gravity dam

The $87 million Noxon Hydroelectric Development is located on the Clark Fork River between Sandpoint, Idaho, and Thompson Falls, Mont., at the headwaters of the Cabinet Gorge Reservoir. Designed by Ebasco Services Inc., New York City, the project is being built for the Washington Water Power Co., Spokane, Wash.

The concrete portion of the dam consists of a gravity spillway section 660 feet long and an intake dam 470 feet long. Earth embankments extend 1,800 feet and 3,000 feet to the north and south, respectively, giving the structure an over-all length of 5,930 feet. The deck of the concrete section rises a maximum of 266 feet above the lowest point of the foundations.

Discharge through the spillway will be controlled by eight tainter gates, each 35 feet high and 40 feet wide. Five penstock tubes, each 26 feet in diameter, feed water through the intake section of the dam to the powerhouse. Here, four Francis turbines, each developing 137,500 horsepower, will drive four 88,400-kva generators capable of providing 400,000 kw of electrical power for the homes and industries of the booming Pacific Northwest area.

Extensive highway and railroad relocation in the reservoir area was done under separate contracts. The major item, a $16 million relocation of tracks of the Northern Pacific Railway, included work on five bridges. It is interesting to note that the relocation contracts totaled approximately the same amount as M-K's general contract for the dam and powerhouse—$21 million. The general contract does not include penstocks, turbines, and generators.

#### Two-stage cofferdam

The project was planned for three stages of diversion, with provision for high and low flows in each. In the first stage, a cofferdam was pushed out from the right bank to enclose the spillway area. Low flows in the river were carried by the channel at the left bank. This first cofferdam was of sand and gravel excavated from the foundation area of the dam.

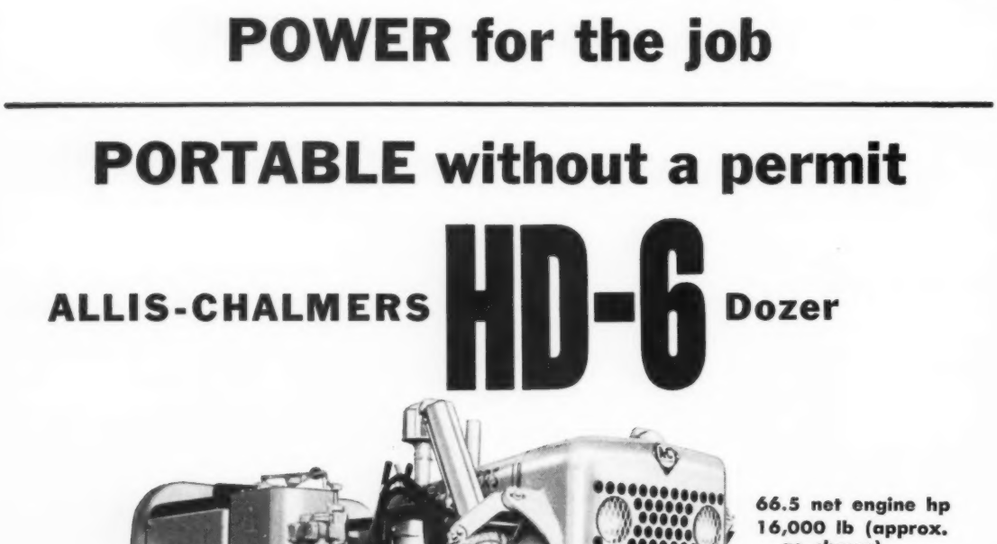
During the first construction season, which was terminated by high water in April, 1957, the spillway was built within the first-stage cofferdam. The four middle monoliths of the spillway dam were left low for future diversion, and eight 12×15-foot sluices were provided through these low blocks. The first-stage cofferdam was breached to permit the high flows to go through the sluiceways and over the low blocks.

As the 1957 high water began to recede, the second-stage cofferdams were started. These reached out from the left bank to enclose the intake dam area, forcing the low-water flows through the sluices in the spillway.


# POWER for the job

## PORTABLE without a permit

## ALLIS-CHALMERS HD-6 Dozer




**66.5 net engine hp**
**16,000 lb (approx. as shown)**
**3 other models available**

Contractors find the Allis-Chalmers HD-6 measures up — both in performance and easy transport. It has the size, power and dependability to make money on all your earthmoving jobs.

When traveling from job to job, there's no need to remove the dozer. The 8-ft. blade — legal width for highway travel — lets you load your HD-6 right onto a truck or trailer — travel quickly with no time lost.

The HD-6 is a maintenance man's tractor. Even in mud, sand, rock and dust, Allis-Chalmers Positive Seals protect tapered roller bearings on truck wheels, idlers and support rollers. These smooth-running assemblies require lubrication only once every 1,000 hours — change greasing time to profitable work time.

There are many reasons why more and more contractors are using HD-6 dozer tractors. See your Allis-Chalmers dealer. He'll be glad to demonstrate on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

**Look ahead... *move ahead* ...and stay ahead with** **ALLIS-CHALMERS**

For more facts, use Request Card at page 18 and circle No. 215

These cofferdams had a core of large rock, with smaller rock, sand, and gravel over the core. A row of interlocking sheet piling was driven for a limited length across a deep narrow channel in the upstream cofferdam in an attempt to shut off the flow of water, but this proved very difficult because of the many large boulders encountered. Even with the sheet piling driven as deep as 80 feet, there was still a considerable amount of leakage into the area.

A battery of pumps unwatered the the cofferdam and pumped out the seepage to keep it dry during construction. Among the larger pumps were a Peerless 400-hp vertical turbine with a 36-inch discharge, three Stang 24-inch pumps, and a Layne 20-inch.

The construction season between the high water of 1957 and 1958 was the critical period for concrete placement. During that season, the intake dam had to be built up within the second-stage cofferdam to a height which would prevent overtopping by this year's high water. This high water was carried through the sluices and low blocks of the spillway.

During the low-water period this year, the flows were diverted through the sluiceways while the low blocks of the spillway were being completed and the intake dam finished. High water next spring will be taken over the spillway crest. The sluiceways are scheduled to be permanently closed in April, and first power generation is planned for September, 1959.

The work of building the cofferdams and excavating for the dam foundations was handled by a number of units including a Manitowoc 4500 dragline, a Bucyrus-Erie 54-B shovel, and P&H Model 1055 and 955 draglines and shovels. Haul units included eight Euclid 17-yard bottom-dumps, 14 "Euc" 10 and 18-yard end-dumps, and two "Euc" TS-18 scrapers. At least eight Cat D8 tractor-dozers worked with the shovels.

Some 285,000 cubic yards of rock was excavated for the foundations. The rock was drilled by two Gardner-Denver Air Trac drills powered from stationary compressors. Shovels and "Eucs" excavated the rock and hauled it for use in the cofferdams.

At one point under the intake structure was an old pothole, eroded by the river in prehistoric times, and extending more than 70 feet below the normal foundation grade. The hole, which was full of boulders of all sizes, was completely excavated and then refilled with 22,000 cubic yards of concrete to become an integral part of the dam foundation.

### Work through cold weather

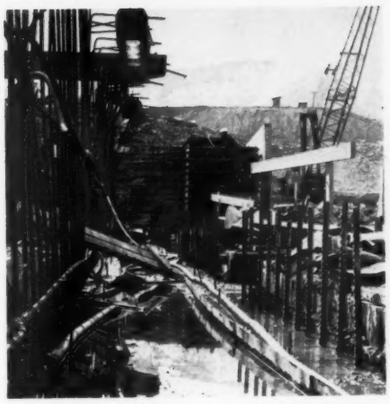
Cold-weather construction operations played an important role in the project, since a considerable amount of concrete had to be placed during periods of below-freezing weather. The first winter (1956–57) was unusually cold, and very heavy snows complicated the work.

Some concrete was placed during this first winter of operation, and it was protected from the cold by canvas-covered housings heated with a variety of agricultural and shop-made heaters. The method was cumbersome, but it enabled the contractor to complete the spillway apron and the low spillway blocks which provided the second-stage diversion.

### Heat lamps

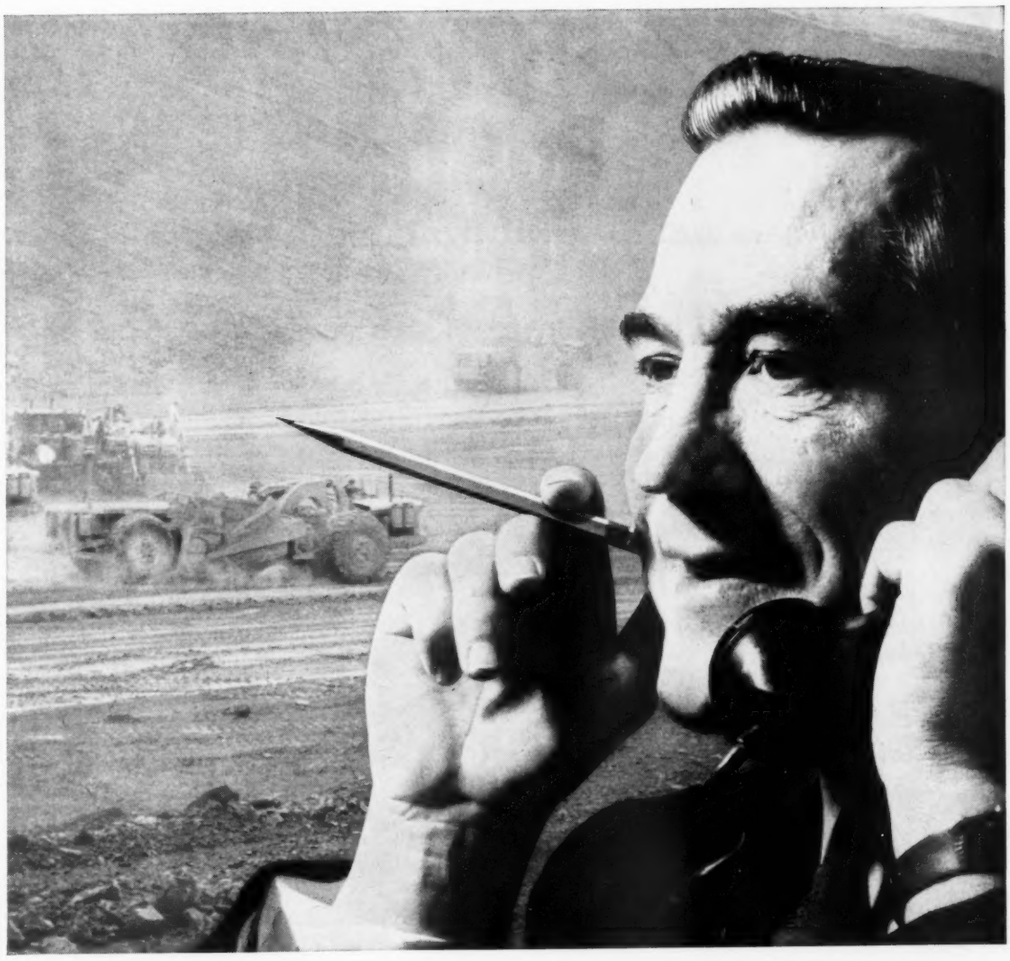
Last winter was not as cold as the first, and concrete-placing operations were again carried on to a limited extent. But with the onset of the 1957–58 season, the contractor sub-

(*Continued on next page*)



The lamps, in use through fall, winter, and spring, are reflected in water covering the surface of a pour to keep concrete from drying. Lamps were on while concrete was being placed, helping retain initial heat, and heat generated by setting concrete.


# The man with the sharp pencil picks Firestone!



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TUBELESS OR TUBED

**Firestone**

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WHEN ORDERING NEW EQUIPMENT ALWAYS SPECIFY FIRESTONE TIRES.

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Concrete aggregates, produced from river gravel in the reservoir area, are delivered to stockpiles near the dam by a Kenworth truck and Omaha 25-yard dump trailer with built-up sides. Underground surge hoppers feed stacking belts.

(Continued from preceding page)

stituted infrared heat lamps for the cumbersome and hazardous system of canvas covers and heaters that had been used to protect concrete during the preceding winter.

Work was far enough ahead of schedule so that mass concrete pours could be closed down at Christmas time for two months. These were resumed on February 25 of this year and continued through the spring in spite of some heavy snows in March.

But while mass concrete was not placed during January and most of February, a small crew continued building some wall sections and other small elements. The 1,000-watt lamps that protected the exposed construction joints of these smaller sections were used in batteries of ten or more, mounted in a shield. The upper portion of the shield was a semicylindrical section of sheet steel fitted with two heavy handles so that the assembly could be lifted or suspended. A grating of heavy wire mesh formed the sides and bottom of the shield and protected the lamps from physical damage.

These assemblies were suspended from reinforcing rods or other convenient hangers about ten feet above the construction joints of the concrete. Before a cold-weather pour was started, the lights were turned on for a short period to melt any ice in the forms or embedded parts and to heat form and concrete surfaces. When temperatures were not too severe, ice could be melted in about 30 minutes.

Electric heaters warmed mixing water to moderate temperatures when the weather was not too cold, but during periods of very low temperatures, water was heated to about 180 degrees F. During very cold weather also, aggregates were heated by crop heaters set in culverts or under the stockpiles. Concrete was usually placed at temperatures of 45 to 55 degrees F.

The heat lamps were kept on while concrete was being placed and for as long as the cold period lasted or until curing was complete. After construction-joint cleaning operations were finished, the surface being heated was covered with a thin layer of water to keep the surface from drying. The radiant heat absorbed by the concrete kept the surface warm and also helped to retain the initial heat and the heat generated by the setting cement. Even when temperatures dropped to near zero, the concrete remained warm.

### Small hoe handles forms

Noble and Blaw-Knox cantilevered steel forms were used for the unexposed transverse 5-foot lifts of the dam and spillway monoliths; cantilevered wood-faced forms were used on exposed faces. Forms for walls and other special sections were fabricated in a carpenter shop and yard on the job site. Some of these were set and stripped by two Washington revolving gantry cranes which served the entire area from a 938-foot-long construction trestle. When large placements of concrete were to be made, forms were handled by a small P&H Model 155A hoe, which had its bucket replaced by a hook. When forms were ready to be stripped, one of the 35-ton revolving cranes picked up the 155A and placed it on a monolith that was protected by wood planking. The little machine and a small crew picked the form sections off one by one and replaced them at the next lift, ready for another pour. Then the revolving crane picked the 155A out and set it on another monolith to repeat the operation. This left the big gantry cranes available for other work.


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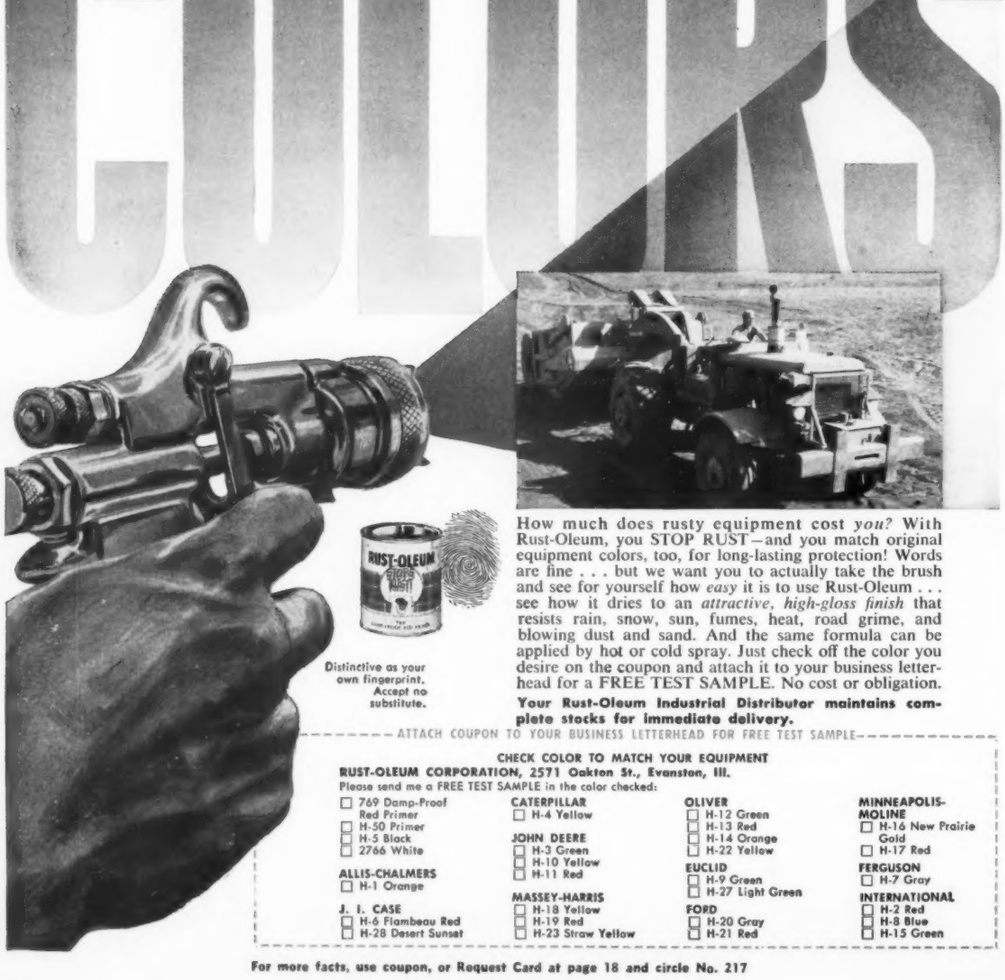






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☐ H-1 Orange

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☐ H-6 Flambeau Red
☐ H-28 Desert Sunset

CATERPILLAR
☐ H-4 Yellow

JOHN DEERE
☐ H-3 Green
☐ H-10 Yellow
☐ H-11 Red

MASSEY-HARRIS
☐ H-18 Yellow
☐ H-19 Red
☐ H-23 Straw Yellow

OLIVER
☐ H-12 Green
☐ H-13 Red
☐ H-14 Orange
☐ H-22 Yellow

EUCLID
☐ H-9 Green
☐ H-27 Light Green

FORD
☐ H-20 Gray
☐ H-21 Red

MINNEAPOLIS-MOLINE
☐ H-16 New Prairie Gold
☐ H-17 Red

FERGUSON
☐ H-7 Gray

INTERNATIONAL
☐ H-2 Red
☐ H-8 Blue
☐ H-15 Green

For more facts, use coupon, or Request Card at page 18 and circle No. 217

The two Washington revolving cranes placed the concrete. These 35-ton cranes were mounted on 60-foot gantries and fitted with 150-foot booms.

### Concrete placement

Concrete aggregates were produced from river gravel deposits in the reservoir area by a subcontractor, J. G. Shotwell, Inc., Seattle, Wash. The five sizes of material, ranging from 6-inch to sand, were trucked from the aggregate plant to the stockpiles by a Kenworth 20-yard and a White 16-yard truck pulling Omaha Standard bottom-dump trailers. These were supplemented at times by a Euclid 16-yard belly-dump.

Since the aggregate source was to be inundated in the spring of this year, before the concrete placement was completed, it was necessary to make and stockpile some 80,000 cubic yards of aggregate for use during the flood period. Provision for this was made at the mixing-plant site.

### Aggregates

Aggregates were dumped into separate hoppers, each feeding one of the five stacking conveyors which built the stockpiles. Each conveyor was equipped with automatic controls, which started the conveyor rolling when material was dumped into the hopper and stopped it as soon as the hopper had been emptied. The hoppers for sand and 6-inch rock were also equipped with Syntron vibrators to keep the material flowing.

A 42-inch conveyor in the 600-foot-long timber recovery tunnel under the stockpiles delivered the sand and gravel to a rescreening and washing plant. Here a Simplicity double-deck screen with water sprays removed fines from and rescreened the coarse aggregates before they went to the concrete plant.

The mixes were proportioned in a C. S. Johnson plant. The aggregates and cement were automatically batched to two Koehring 4-yard tilt mixers, which discharged into an 8-yard wet-batch hopper. From the plant, the concrete was handled by rail in Gar-Bro 4-yard buckets carried on special flatcars. Each car carried two full buckets and had space for an empty. Three General Electric 25-ton diesel locomotives shuttled the cars from the plant out to the revolving cranes on the construction trestle. In a few instances, the concrete was hauled by truck and placed by a Manitowoc 4500 crane to supplement the operation of the gantries.

Air-operated Malan vibrators consolidated the mix. Air for this and other uses was supplied by three 1,200 and 1,500-cfm Ingersoll-Rand stationary compressors and piped throughout the job area.

During the peak of production, as much as 3,200 cubic yards of concrete was placed in a single 24-hour day; 53,000 cubic yards was placed in one period of 21 working days.

(*Continued on next page*)

A line of stacking conveyors builds up stockpiles of five sizes of material. The 100-foot-long belts stop and start automatically, running only when aggregate is in the surge hoppers. The C. S. Johnson plant is in the background.


ENDS MESS AND WASTE

NEW SINCLAIR LITHOLINE MULTI-PURPOSE GREASE CARTRIDGE

EASIER, FASTER, CLEANER LUBRICATION FOR CONTRACTORS

There's no mess, no spilling, no waste in filling your grease guns—when you use the new Sinclair LITHOLINE Multi-Purpose Grease Cartridge. Takes only seconds to pop a cartridge into the gun—and you're ready to lubricate. Fits all regular cartridge type guns.

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Rock for the wrap-around at the junction of the concrete and earth sections of the dam is loaded to an Athey PR21 25-yard dump wagon pulled by a DW21, by a Bucyrus-Erie shovel with 2-yard dipper. The Athey, left, dumps the rock into place after making the short haul from the quarry.

(*Continued from preceding page*)

**Earth embankments**

Although the two embankments are similar in cross section, they differ in shape and construction. The northeast embankment curves sharply away from the north end of the spillway to follow the alignment of a rock ridge on which it is built. The southwest embankment extends generally straight across the valley from the south end of the intake dam. It is founded on a base of clay which was laid down in the bed of a prehistoric lake.

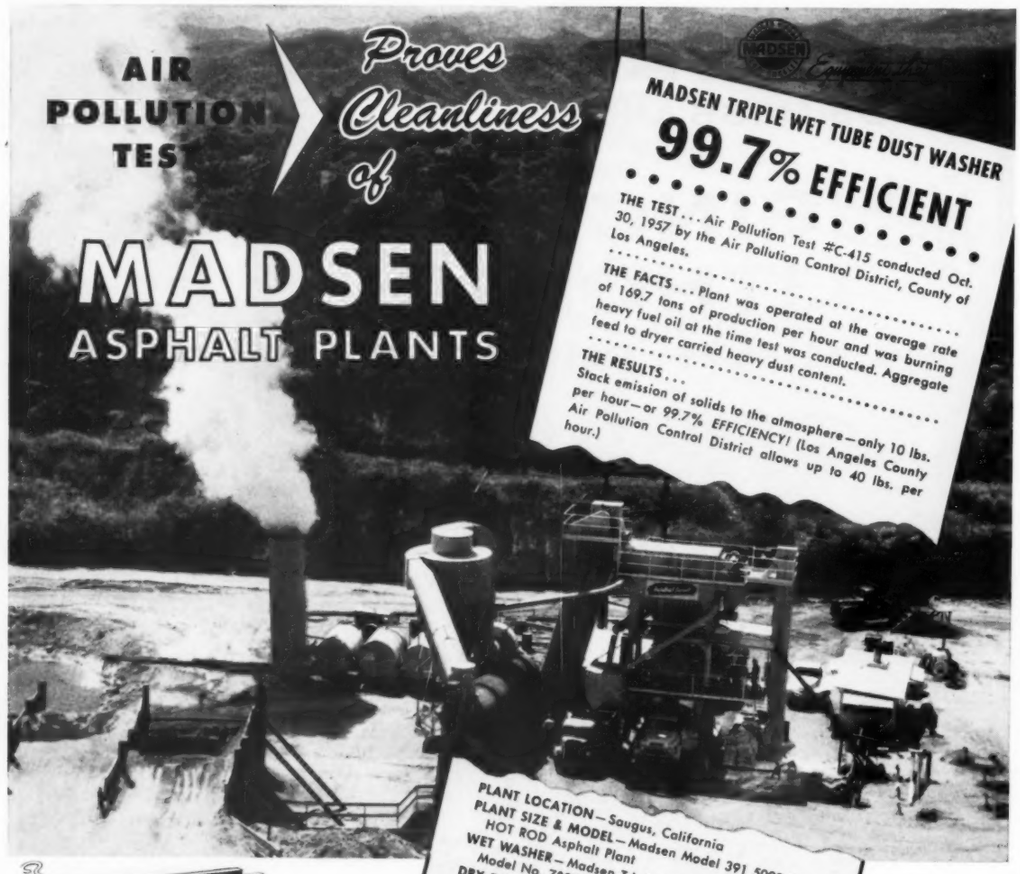
Each dike has a clay core with a shell of sand and gravel and, where necessary, riprap protection. All the clay was obtained from a borrow pit on the north side of the river. Though this material was very difficult to handle, it was moved by scrapers. Euclid TS-18 and Cat DW21 scrapers pushed by Cat D9 tractors loaded and hauled the material. Compaction was supplied by heavy sheepsfoot rollers.

Although the foundation for the northeast abutment was a rock ridge, there was one pothole which had been eroded by the ancient river. Since this was too deep to be excavated economically, it was sealed with a grout curtain. Excavation was carried down to river level, and a concrete slab was poured.

Then a subcontractor, Selby Drilling Corp., Boise, Idaho, placed a grout curtain to seal the area. The stage grouting was carried in 5-foot increments from the concrete slab down to the bottom of the pothole. Grouting holes were spaced at 1-foot centers. At the completion of the grouting a hydrostatic test showed the area to be watertight.

Construction of the southwest embankment was sublet to Bud King Construction Co., Missoula, Mont. Since the clay core material could be worked only during the dry summer months, King worked through fall and winter to build up the shell of the dike and to place the riprap. Cat DW21 scrapers hauled the clay from the same pit used for the northeast embankment. Sand and gravel shell material came from a borrow pit nearby.

Rock for the wrap-around fill adjacent to the dam and for the embankment riprap was obtained from a quarry about a mile from the struc-



AIR POLLUTION TEST
Proves Cleanliness of
MADSEN
ASPHALT PLANTS
MADSEN TRIPLE WET TUBE DUST WASHER
99.7% EFFICIENT
THE TEST... Air Pollution Test #C-415 conducted Oct. 30, 1957 by the Air Pollution Control District, County of Los Angeles.
THE FACTS... Plant was operated at the average rate of 169.7 tons of production per hour and was burning heavy fuel oil at the time test was conducted. Aggregate feed to dryer carried heavy dust content.
THE RESULTS... Stack emission of solids to the atmosphere—only 10 lbs. per hour—or 99.7% EFFICIENCY! (Los Angeles County Air Pollution Control District allows up to 40 lbs. per hour.)
PLANT LOCATION—Saugus, California
PLANT SIZE & MODEL—Madsen Model 391 5000-lb. HOT ROD Asphalt Plant
WET WASHER—Madsen Triple Wet Tube Dust Washer Model No. 7809
DRY DUST COLLECTOR—Madsen 12' dia. round cyclone
DRYER—Madsen 84" x 30'

Industrial Asphalt

Industrial Asphalt, Los Angeles, California, owns and operates the Madsen Model 391 HOT ROD Asphalt Plant shown above. Plant is located at Saugus, California.

MADSEN Asphalt Plants are built in capacities from 1000 lbs. per batch to 6000 lbs. per batch. Whatever your asphalt plant requirements are, there's a MADSEN Plant designed for you.

*We've talked about the clean operation of MADSEN Asphalt Plants ... and now here's the proof. Even under adverse operating conditions MADSEN Asphalt Plants meet the strictest requirements for clean operation!*

The MADSEN Model 391 HOT ROD Asphalt Plant (shown above in full operation), is streamlined in appearance with no extras or "trimmings." It is designed for easy transport and fast set-up, yet it is ideal for the operator who wants to set up permanently.

Here are some of the outstanding features of the MADSEN HOT ROD:

- Fully-enclosed (running in oil) gear box reduction unit that connects right to the mixer shafts ... eliminates exposed mixer timing gears.
- MADSEN Twin-Shaft Pug Mill Mixer (patented) with externally removable sectional liners, improved mixing and faster discharge.
- Exclusive bin design (Pat. Pend.) eliminates segregation.
- MADSEN Asphalt Pressure Injection System (patented) for faster asphalt injection, improved mixing and reduced mixing time.
- Fast air operation of bin gates, weigh-box gate, asphalt pressure injection and mixer gate.
- *And, of course, CLEAN OPERATION to meet air pollution requirements everywhere.*

*Built in capacities of 4000 lbs. and 5000 lbs., the MADSEN Model 391 HOT ROD Asphalt Plant has shown an ability to produce in excess of 200 T.P.H. at a highly consistent rate. Ask your MADSEN Distributor for Catalog No. 391 or write MADSEN WORKS, Baldwin-Lima-Hamilton Corporation, P.O. Box 38, La Mirada, California or Baldwin-Lima-Hamilton Corp., Lima, Ohio*

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ture. Here King drilled and blasted the rock and loaded it with a Bucyrus-Erie 44-B shovel with 2-yard dipper. Four Athey PR21 rock wagons pulled by DW21 tractors hauled the rock.

The M-K contract for the dam and powerhouse did not include the furnishing and installation of the penstock liners, turbines, or generators. These were supplied under separate prime contracts. All are expected to be in readiness so that the first generating unit can be put into service by September 1, 1959. Successive units will be ready at 3-month intervals, and the four units will all be in service by June, 1960. There is provision for the installation of a fifth unit.

**Personnel**

Morrison-Knudsen employs a maximum of about 500 workmen on the project, a third of whom live in three barracks on the camp site; the remainder live in trailers and other available housing scattered over a wide area. The mess hall on the camp site serves about 200 workmen. Six houses and a 14-unit trailer court are being used by supervisory personnel.

Directing the activities on the site for M-K is project manager George "Pete" Piedmont, who is closely assisted by project engineer Leland B. True. Superintendents on the job include Bynum Swearinger, swing shift; Archie Lamberson, night shift; Jim

Project manager on the Noxon Dam job for Morrison-Knudsen Co., Inc., is George "Pete" Piedmont.

Napper, carpenter; Marvin Hixson, concrete; Bill Haggerty, electrical; Bill McGee, rigging; and John Logan, excavation. The master mechanic is Tony Zaversnick.

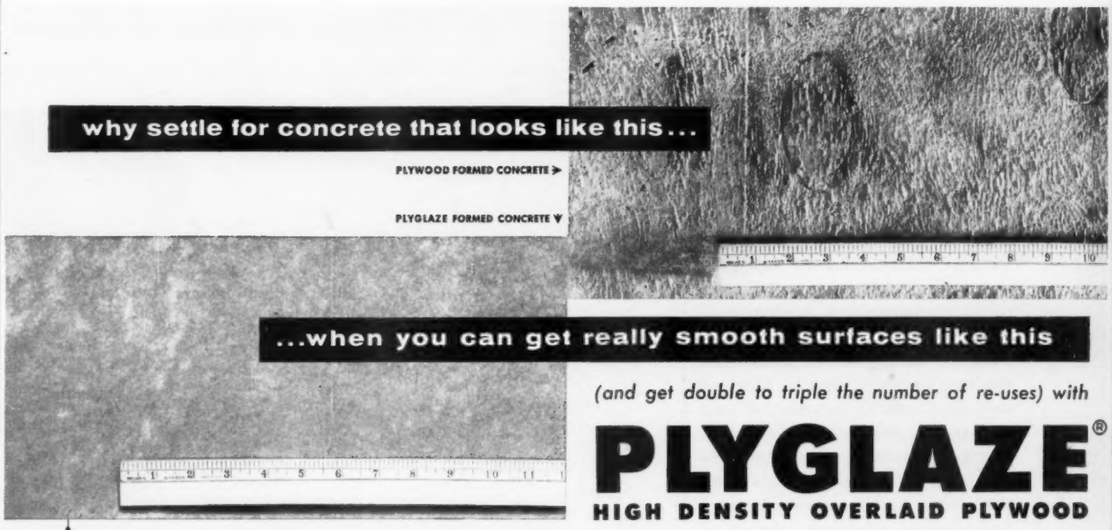
Ebasco Services is responsible for the engineering and construction management of the project, with F. L. Weiss as project manager and P. L. Guthrie as assistant project manager. J. G. "Jack" Roberts is resident engineer for the dam and powerhouse. The coordinating engineer for the Washington Water Power Co. is T. H. Judd. The chief civil engineer of the power company is K. O. Strenge. THE END

## Vermont states its case

The Vermont State Department of Highways is distributing a small booklet, designed to explain to the public both the state's procedure and the property owner's rights in the matter of survey, right-of-ways, etc.

For more facts, use coupon or circle No. 220→

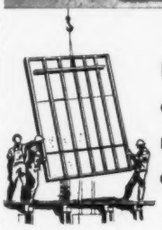
Canvas-covered housings, heated for the most part with agricultural heaters and shop-made units, made it possible for the contractor to complete the spillway apron and the low spillway blocks providing for second-stage diversion during the first winter. This method was dropped in favor of using infrared lamps to heat pours the following winter.



why settle for concrete that looks like this...
PLYWOOD FORMED CONCRETE
PLYGLAZE FORMED CONCRETE
...when you can get really smooth surfaces like this

(and get double to triple the number of re-uses) with

# PLYGLAZE®

**HIGH DENSITY OVERLAID PLYWOOD**



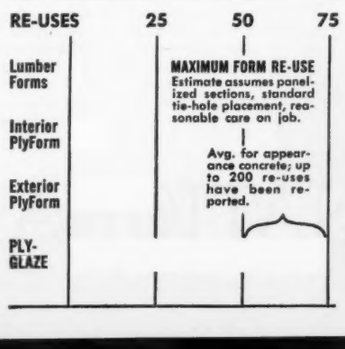
**If you have a job that calls for smooth architectural concrete—or if you can design forms to get 25 or more pours on the same or subsequent jobs—you can save money, time and trouble with PlyGlaze.**

**SMOOTHER CONCRETE**—The untouched photos above, taken right after stripping, show the big difference in concrete formed against ordinary concrete form grade plywood and PlyGlaze high density overlaid plywood.

PlyGlaze's hard, glossy-smooth surfaces form really smooth concrete every-time—unmarred by grain pattern, checks or plywood patches.

For jobs where architectural concrete is specified you can eliminate almost all rubbing and grinding, except for fins and tie holes. Ceiling slabs can be painted direct, without expensive plastering.

**GIVES UP TO 200 RE-USES**—With reasonable care, you should get from 50 to 75 re-uses with PlyGlaze. The limit actually depends on the form design and job requirements. Contractors who use panelized form sections with standardized tie-hole placements have reported getting several hundred re-uses.




**CUTS COSTS**—Although PlyGlaze does cost more initially than PlyForm grade Exterior plywood, it actually saves you money in the long run for these reasons:

1. PlyGlaze formed concrete needs much less finishing or sacking.
2. Oiling is not needed between pours other than to facilitate cleaning.
3. On jobs where form costs can be amortized over 25 or more pours, PlyGlaze actually costs less per foot of concrete formed.

**COST PER-SQUARE-FOOT-PER-USE***

| No. Re-Uses | 10 | 25 | 50 | 100 |
|---|---|---|---|---|
| PLYGLAZE | .037 | .015 | .007 | .004 |
| Exterior PLYFORM | .020 | .008 | Gives Max. 25 re-uses | |

*Based on the average prices quoted by St. Paul & Tacoma Lumber Co. during 1957 for the following material delivered in Chicago: ¾" PlyGlaze, ¾" PlyForm, oiled, edge sealed.

**SPECIFICATIONS, AVAILABILITY**

**Material:** PlyGlaze is made by fusing a hard, glossy phenolic resin fiber to both sides of Exterior plywood. The overlay is not simply a coating that can work loose; it is fused under heat and pressure to become an actual part of the panel. It is more durable in every way than the wood itself.

Base panel is top quality DFPA-inspected solid core Exterior plywood. It is sanded *before* overlay is applied, assuring uniform thickness.

**Sizes:** (standard and custom) PlyGlaze is available in all standard plywood sizes and also can be custom-sized to your exact specifications.

**Source of supply:** PlyGlaze is available anywhere in the country; write for name of nearest representative. It can also be specified in lieu of ordinary plywood with most patented forming systems.

**POINTS IN BRIEF**

- Has the strength, workability and adaptability of Exterior PlyForm.
- Strips easily; the hard non-absorbent surfaces will not stick to the concrete.
- Overlay will not soften or come loose.
- Overlay minimizes moisture pick-up and resultant loss of rigidity.

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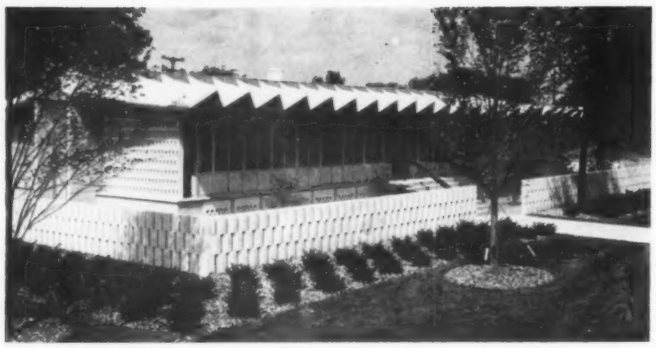


The American Concrete Institute dedicates its new international headquarters building this month in Detroit, Mich., during the 11th Regional Meeting.

## Bridge design awards are presented by Lincoln

*(See photos in Construction Camera, page 143)*

Winning designs in a welded-bridge design competition, conducted by The James F. Lincoln Arc Welding Foundation, showed substantial savings in steel and cost, and demonstrated that welded bridges could be both beautiful and easy to maintain. Award designs were made for welded bridges that are now being built on the new interstate and defense highways.

Farland C. Bundy and Charles S. Matlock, engineers with the Bridge Division of the Texas State Highway Department, received the $10,000 first award for the recently completed Buffalo Bayou Bridge in Houston, a twin-span 668-foot, all-welded continuous plate girder structure.

The foundation made two second awards of $7,500 each. Dale C. Hoffman and Dwight H. Sparks of Columbus, Ohio, received one for the design of a 4-span, 398-foot haunched girder bridge. A team of Dallas, Texas, Turnpike engineers—Joe C. Bridgefarmer, Douglas A. Nettleton, and William L. Powell—received the other second award for an all-welded arch bridge on the Dallas-Fort Worth Turnpike. The 192-foot span of four welded box-girder arch ribs is claimed to be the first bridge of this type in the United States.

## ACI dedicates new Detroit headquarters

The American Concrete Institute will dedicate its new international headquarters building at 22400 West Seven Mile Road, Detroit, Mich., during its 11th Regional Meeting, October 27 through 29.

The ultramodern concrete building features exposed concrete in a precast reversed-fold, folded-plate roof, cantilevered from each corridor wall. Deep X-shaped beams with diamond-shaped openings for skylights form the tie across the corridor. Exterior decorative concrete includes thin precast exposed-aggregate panels set in aluminum window frames, and heavier grade-level precast grills. The interior decorative concrete includes two types of continuous fluting on the structural bearing walls. All substructure concrete walls were cast in 30-inch square steel forms, and form layout on all exposed walls was planned for symmetrical appearance. Exterior concrete was painted with a water-thinned polyvinyl acetate emulsion paint to lessen the absorption of industrial smoke and soot.

The building was designed by Minoru Yamasaki, of Yamasaki, Leinweber & Associates, Birmingham, Mich. Amman & Whitney, of New York and Milwaukee, were structural consultants on the project, and Pulte-Strang, Inc., Ferndale, Mich, was the general contractor.

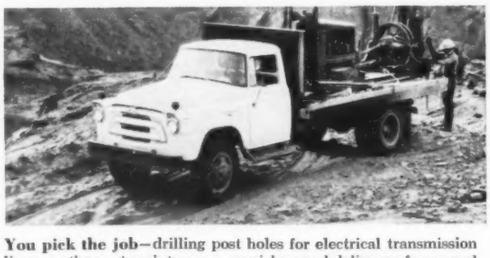
## Pennsylvania to buy additional snow fence

The Pennsylvania Department of Highways will purchase 1,678, 200 feet of snow fence for this winter. Of this amount, 1,204,167 feet of fence will replace condemned snow fence. Somerset County will receive the largest amount of new fence, 150,000 feet; Westmoreland County, 140,000 feet; and Erie County, 100,000 feet.

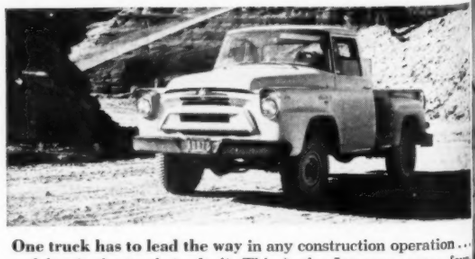
## Air Reduction Sales builds plant in Kansas

Construction has begun for a new oxygen and nitrogen-producing plant in Kansas City, Kans., for Air Reduction Sales Co., a division of Air Reduction Co., Inc., New York City firm.

The plant is expected to be in operation sometime in December.



**You pick the job**—drilling post holes for electrical transmission lines, on-the-spot maintenance, or pickup and delivery of men and materials—there's an INTERNATIONAL ready to help complete it quicker at least cost. Conventional or compact-design with three or six-man cab options. Dump, flatbed, stake, or specialized bodies, on single rear-axle chassis with GVW up to 34,000 lbs., to meet any requirement anywhere.



**One truck has to lead the way** in any construction operation... and here's the truck to do it. This husky INTERNATIONAL four-wheel-drive model is all-truck engineered to hustle men and up to a ton load to the job site with true short-stroke power and economy. What's more, with its exclusive INTERNATIONAL cab mounting and suspension system, the ride is smoother and easier whether you're tracking down the highway or off the road.

INTERNATIONAL TRUCKS

## New-type aluminum bridge tested in Pennsylvania

An aluminum bridge employing aircraft design principles was unveiled recently on the campus of Lehigh University, Bethlehem, Pa.

The bridge, a test unit, was designed and built by the Fairchild Engine & Airplane Corp., of Hagerstown, Md. Co-sponsors of the project included the U. S. Bureau of Public Roads; Aluminum Co. of America; Kaiser Aluminum & Chemical Sales, Inc.; Metals Division, Olin Mathieson Chemical Corp.; and the Reynolds Metals Co.

Basically, the bridge is fabricated of thin-gage stressed sheet aluminum. Twenty-four feet wide and 50 feet long, the bridge supports a two-lane conventional concrete roadway with a design vehicular load limit of 15 tons per lane.

According to Professor William J. Eney, director of the Fritz Engineering Laboratory at Lehigh, 130 different instruments were installed to record the behavior of the prototype bridge under both static and dynamic load conditions. Special pulsating jacks were used to shake the structure for more than a million cycles—wear equal to more than 100 years of normal use.

Test loads up to 52 tons, or 175 per cent of the design vehicular load limit, reportedly were placed on the bridge without any sign of failure.

Ease of assembling the aluminum bridge test unit designed and built by the Fairchild Engine & Airplane Corp., Hagerstown, Md., is demonstrated during erection of the bridge at the test site at Lehigh University, Bethlehem, Pa. Workmen are guiding a section onto concrete piers.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**Where punishment** is measured by the ton, you'll find an INTERNATIONAL like this model VF-212 taking more than its share. Within a full range of six-wheelers, you can choose a truck built to handle up to 90,000 lbs. GCW. Six-cylinder or V-8 gasoline or LPG engines, or diesels up to 335 hp. team up with extra-heavy-duty axles to *keep* big loads moving.

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For more facts, use Request Card at page 18 and circle No. 221


## Heat exchanger prevents ice damage to piers

Two research engineers—George E. Gross, administrative supervisor, and William F. Cramer, Jr., senior engineer, both at Armour Research Foundation of Illinois Institute of Technology—have developed a heater exchanger which completely eliminates ice from areas around piers, docks, and boats during winter months. Patent is pending on the unit, which uses the principles of heat exchange and the upsetting of stratification of water required for freezing. It is inexpensive, portable, and melts any pattern in the ice.

A unit tested at Lake Geneva, Wis., kept the water at 35 degrees, even though the coldest weather reached 20 degrees below zero. At 35 degrees, the unit was operating at only 38 per cent efficiency. At this rate, the engineers estimated the device compensated for the freezing of roughly 30,000 pounds of ice in 10 hours.

A 70-pound pilot unit, like the one at Lake Geneva, can be installed for about $500 and would cost $16 per year to operate. In most cases, the initial cost would be far less and maintenance costs would be low, the inventors say.

## B&D expands in Mexico

The Black & Decker Mfg. Co., Towson, Md., has opened a new sales warehouse for the company's electric tool products in Mexico City. Warehouse and offices occupy 4,200 square feet of floor space in the new premises, which will also house the firm's Mexico City Service Branch. Jesus Mendoza continues as Mexican sales manager.

## Armco Drainage news

Fay A. Kennedy has been named to succeed Jerome J. Jarrett as chief accountant of Armco Drainage & Metal Products, Inc., Middletown, Ohio, when Jarrett retires within a few months. Kennedy has held the same position in the firm's midwestern division headquarters at Topeka, Kans., for the past two years.

Lewis E. Welshofer has been named to the post of personnel adviser.

Before concrete work starts, snow is washed from the rock fill of Wishon Dam in California with hot water from a hydraulic monitor.

Crews place reinforcing steel for the concrete face of the dam. The facing was completed above the level of the frozen reservoir before winter temperatures closed down the project.

After reinforcing has been set, concrete is placed for the upstream face with a slip form. Freshly poured concrete, foreground, is covered to keep it from freezing.

# Hot water keeps dam job going in winter cold

Racing against time and winter, crews of the Morrison-Walsh-Perini joint venture on Wishon Dam, 60 miles east of Fresno, Calif., on the Kings River, met a concrete-placing deadline in time for the dam to capture the runoff of this year's very heavy snowfall in the Sierras. What made the work possible was hot water—hot water for the concrete mix and hot water for sluicing snow from the rock fill on the upstream face of the dam. By beating the first of June deadline, the crews were able to complete Wishon Dam for Pacific Gas & Electric Co., San Francisco, well ahead of the scheduled autumn date. Work on the two powerhouses will be finished late this year.

Started in July, 1955, as part of PG&E's $80 million Kings River Project, the dam is at an elevation of 6,550 feet, and winter comes early at this height. When snow closed the job last November, crews had placed more than 3¾ million cubic yards of rock and placed concrete to an average thickness of 3 feet to the level of the reservoir. Forty slabs of concrete, measuring about 60 × 80 feet and requiring about 20,000 yards of concrete, remained to be placed.

By March 10, the job was going again, even though 9 feet of snow covered the area and night temperatures sometimes dropped as low as 10 degrees.

Hydraulic monitors, using hot water, sluiced ice and snow from the rock fill in preparation for concrete operations. Then crews, working two 12-hour shifts, placed reinforcing for the slabs and concrete that was mixed with water heated to 150 degrees F. This speeded the release of heat by

**$45 MILLION NUCLEAR POWER PLANT** gets the best in portable heat from Herman Nelson units. Located 50 miles southwest of Chicago, the plant is being built by General Electric for Commonwealth Edison and six other large utilities. Bechtel Corp. is the engineer-constructor. Heaters are in use 24 hours a day, seven days a week, for curing the concrete.

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**15° BELOW ZERO** kept Herman Nelson heaters at work supplying safe heat for building the Sparrow Hospital annex, Lansing, Mich. Contractor is Reniger Construction Company.

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the concrete and helped keep the mix from freezing before it set. As the slabs were poured, an inch-thick blanket of commercial insulating material was placed over the concrete to hold heat in and maintain a minimum temperature of 50 degrees for three days after a pour.

This speed-up job was finished well ahead of the June 1 deadline, making possible the storage of 128,000 acre-feet of water—the full capacity of the reservoir and 50,000 acre-feet more than was expected to be captured for the 1958 season.

THE END

### Top battery maintenance improves winter starting for earthmoving rigs

Cold-weather starting of diesel-powered crawler tractors and other earthmoving equipment places heavy demands on storage batteries. To get peak winter battery performance, the electrolyte or water level should be periodically checked. The battery should not be overfilled, because this allows the electrolyte to splash out and corrode all metal it contacts. If the battery requires water more often than once every two weeks, the charging rate is too high.

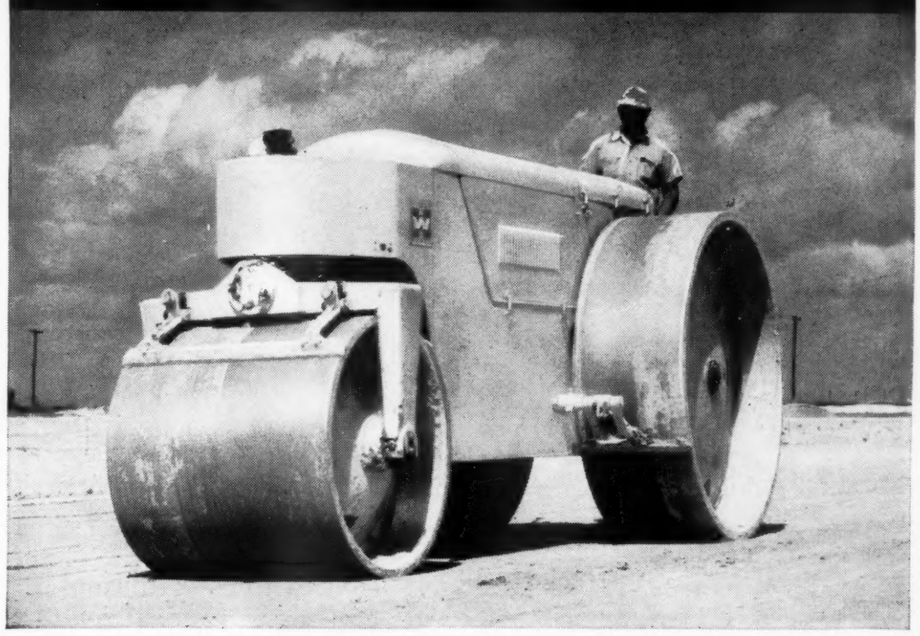
By occasionally washing the battery with a baking soda solution—one pound of soda to one gallon of water—the acid present on the case is neutralized. After this, the battery must be rinsed with cold water. Clean the terminals with a wire brush until corrosion is removed and then coat them with petroleum jelly. Maintain the battery in a normal state of charge—the specific gravity should be above 1.225—by keeping the generator output and voltage regulator in proper adjustment.

In cold weather, add water in the morning, just before or right after starting. Never use the electric starter more than 30 seconds at a time, and then allow approximately two minutes between cranking cycles. This allows the battery plates to cool and enables the battery to recuperate sufficiently to deliver a surge of power. To keep storage batteries up to strength and ready for use, recharge them when their specific gravity drops to 1.240.

### CCI extends territory of five field engineers

The Calcium Chloride Institute, Washington, D. C., has extended the territory coverage of five CCI engineers. William J. O'Brien, working from Philadelphia, serves Delaware, Maryland, Pennsylvania, New York, and New England. Keith M. Saville, headquartered in Peoria, Ill., covers Indiana, Illinois, Missouri, and Iowa. Harry A. Smith, with Racine headquarters, handles Wisconsin, Michigan, Minnesota, and Chicago. Henry B. Aikin, headquartered in Washington, D. C., works with federal agencies in that city and with Virginia, West Virginia, and North Carolina. Gordon K. Owen, from Lexington, Ky., covers Kentucky, Ohio, Tennessee, Alabama, and Georgia.


HUBER-WARCO
3-Wheel rollers



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The Huber-Warco 3-WHEEL ROLLER is a powerful, rugged machine built for economy, performance and durability. A combination of torque converter, tail-shaft governor and 2-speed transmission adds to the efficiency . . . doubles available power and supplies it instantly . . . cuts fuel consumption . . . maintains rolling speeds automatically at any set speed. Both standard and variable weight models are available. See your Huber-Warco distributor for complete details.

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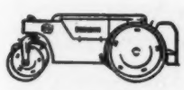
3-WHEEL ROLLERS

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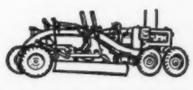
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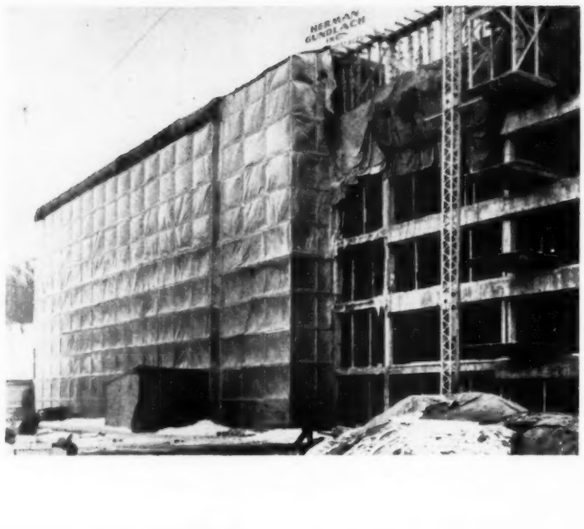


OUTSIDE TEMPERATURES HOVER AROUND ZERO, but behind the screen of Visqueen polyethylene film, 10 high-pressure steam unit heaters, each furnishing about 300,000 Btu with 50 pounds of pressure, enable construction crews to work in a 65-degree temperature on Wadsworth Hall, a new dormitory at the Michigan College of Mining and Technology in Houghton. Herman Gundlach, Inc., also of Houghton, is the contractor on the 802-foot-long six-story-high steel and concrete frame building.


# CAT FUEL INJECTION EQUIPMENT CUTS COSTS BY PROVIDING MAXIMUM ENGINE PERFORMANCE

**Presetting at factory for accurate performance eliminates field settings, makes installation of Caterpillar fuel injection pumps quick and simple.**

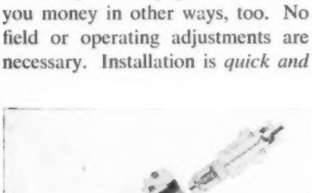
The fuel injection system is a key to peak engine performance. It must deliver to each cylinder equal amounts of fuel at precisely the right time. Deviation means a loss in horsepower. That's why it pays to use Cat fuel injection equipment.

Cat injection equipment can save you money in other ways, too. No field or operating adjustments are necessary. Installation is *quick and simple*. All pumps are interchangeable for different cylinders and between engines of the same model.

This interchangeability permits smaller parts inventories, makes replacement inexpensive by eliminating custom fitting, and makes replacement possible in a matter of *minutes* right on the job regardless of the experience of the mechanic.

Genuine Caterpillar injection equipment is built to last. With clean fuel, a life of 20,000 service meter hours is not unusual.

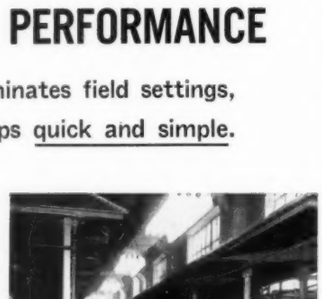
Pumps, plungers and barrels are manufactured from the finest chromium alloy, so hard that diamond dust is required for lapping the plungers and barrels. Pumps are tested and preset at the factory to provide accurate metering, timing and fuel pressure.



HIGHEST STANDARDS in the industry go into the manufacture of Caterpillar fuel injection equipment. Pump plungers and barrels, for example, are finished to tolerances so fine that the heat from your hand will expand a plunger enough to make it larger than the matching barrel.

**SERVICE TIP**

Your Caterpillar Dealer has the testing equipment to determine accurately when fuel injection systems parts should be replaced. And testing is the only sure way of knowing.



RUN-IN TESTS—four hours on pumps, two on valves – are conducted on these Caterpillar-built test machines before a pump or valve leaves the factory. Strict testing procedure means perfect performance of genuine Caterpillar injection parts.

Single-orifice fuel injection valves minimize the possibility of clogging or fouling. A spring-loaded plunger within the valve opens by fuel pressure at the proper time for uniform and precise injection. Extra protection is given by a fine-mesh screen. This clean, accurate injection means less down time and lowest fuel cost per unit of power.

Don't risk real damage to your Caterpillar equipment with an improperly functioning fuel injection system. Test systems regularly and replace worn parts with genuine Caterpillar parts. Your Caterpillar Dealer has the full story. See him today. And remember, he stands behind every part he sells.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

Improper fuel injection equipment can be expensive. For instance, if a machine's owning and operating cost is $10 per hour, its total cost in a 2,000-hour season is $20,000. For a 200-horsepower machine that's $100 per horsepower. A poorly functioning fuel injection system which robs the machine of 5% of its horsepower (10 HP) could mean a season loss of $1,000 (10 [HP] x $100). Don't take chances. Standardize on Cat equipment.

**CATERPILLAR**

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For more facts, use Request Card at page 18 and circle No. 224


## U. S. Steel division holds design contest

The American Bridge Division, U. S. Steel Corp., Pittsburgh, Pa., is sponsoring a steel highway bridge design competition offering 15 awards totaling $44,000 to engineers and college engineering students. The contest is aimed at stimulating the best use of steel in the design of bridges for the interstate and defense highway system to be built during the next 15 years.

The competition poses the problem of designing an overpass structure in steel to carry a two-lane highway at right angles over a four-lane interstate highway on level ground. The overpass must be designed in accordance with the standards developed by the American Association of State Highway Officials and approved by the U. S. Bureau of Public Roads. These standards are entitled "Geometric Design Standards for National System of Interstate and Defense Highways".

Eight awards will be made for winning entries submitted by professional and design engineers; and seven awards will be made to college engineering students. Any professional and design engineer and college engineering student may enter the competition except employees or members, and their immediate families, of the U. S. Steel Corp., its divisions, subsidiaries, agents, and dealers; structural steel fabricating firms; the American Institute of Steel Construction; and the rules committee and judges.

Complete information may be secured from the American Bridge Division, U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.; and from the American Institute of Steel Construction, 101 Park Ave., New York 17, N. Y. Deadline for the competition is midnight, May 31, 1959. All entries should be mailed to AISC.

## Aero Service names

Herbert P. Lee has been named general manager of Aero Service Corp. (Western), photogrammetric engineers of Salt Lake City, Utah. The firm performs aerial mapping and exploration.

A V-plow with wings bulldozes snow off a trunk-line highway near Painesdale, Mich., in the Upper Peninsula. This region is a major trouble spot in the winter maintenance program of the Michigan highway department.

### Michigan men, machines fight around the clock to free highways of snow

Winter maintenance costs in Michigan continue to increase as the state opens more rural expressway routes —a total of 150 miles of 4-lane divided highways was opened in 1957. This year, $6,500,000 will be spent on trunk-line routes alone; over 100,000 tons of rock salt and 13,000 tons of calcium chloride will be used, and some 3,000 men and machines will fight to keep the 9,300 miles of state trunk-line highways clear of snow and ice.

In major trouble areas, the Michigan State Highway Department employs giant V-plows, which can bulldoze any size of snowdrift, and Snogo units, which suck up snow from embankments and throw it 100 feet from the roadway. In the Upper Peninsula, rows of closely planted pine trees line many main trunk-line highways. The trees and 16-foot-high snow fences help check snow from drifting across the highways.

State highway officials report that the extensive winter program actually pays dividends, not only in added mobility and highway safety, but also in dollars and cents. Michigan's winter gas and weight tax receipts, which remain much higher than those in a number of neighboring states, pay for all costs of state highway maintenance.

### National highway system is theme of PCA film

"People and Movement", a new film from the Portland Cement Association, is aimed at increasing the public's understanding of the planning behind the new highways now being built across the nation as part of the National System of Interstate and Defense Highways.

The 17-minute, sound-color film discusses the changes in the nation's population and how these changes are affecting land use and movement in urban, suburban, and rural areas. Super expressways, redevelopment models, slum clearance projects, and rural industrial developments are pictured.

The film is available to civic groups, schools, service organizations, and other interested audiences from the PCA's 32 district offices or from its headquarters, 33 W. Grand Ave., Chicago 10, Ill.


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Exclusive with Huber-Warco MOTOR GRADERS is the complete hydraulic cab-controlled blade movement. In less than a minute, and without ever leaving the cab, the operator can move the blade from a 90° bank sloping position on one side to 90° on the other. There are NO manual adjustments to be made. This bonus feature is on all Huber-Warco torque converter and standard transmission MOTOR GRADERS ranging in horsepower from 75 to 195 h.p. Get all the important facts . . . contact your Huber-Warco distributor today.

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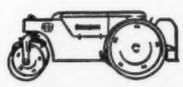
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Winter has closed in, but Material Service Corp., Algonquin, Ill., continues prestressing operations on girders for Illinois Toll Highway bridges. A completed 44-ton 78-foot girder is lifted from the bed by a Lima 1201 3-yard crane, left, and a P&H 1055 for transfer to the temporary storage area. The International TD-9 uses a Drott 4-in-1 loader to spread gravel.

Winter Work

# No winter shutdown for prestress plant in turning out bridge girders

***Firm supplying concrete girders for Illinois toll facility takes special steps to keep work going through cold months***

by BILL ALLEN
field editor

By adapting its methods to meet severe weather conditions, a prestress plant kept operating through a cold northern Illinois winter. Even though the mercury dropped to 18 degrees above zero, the plant continued to turn out concrete girders to keep pace with the bridge building on the Illinois Toll Highway.

The big girders were normally cured by steam heating at Material Service Corp.'s plant in Algonquin, Ill., and this made the plant particularly suitable for a cold-weather operation. However, special precautions had to be taken to combat the freezing temperatures.

Although the plant continued to operate around the clock, the pouring

◄ A workman tapes the slots in the block-out plates to keep concrete from leaking out of the form. The A-frame carries 50-ton hydraulic jacks which grab the upper pattern of wires at the blocked-out space.

Frost is knocked off the steel by a jet of steam before the forms are set. Steel bands around the bottom pattern of cables prevent longitudinal cracking at the ends of beams when cables are cut. ►

Crewmen guide a Form-Crete steel form as it is lowered into place by a crane. Steel plates hold the lower edge of the form in place.

The preheated concrete is delivered to forms at temperatures between 50 and 60 degrees. As the American 395 makes the dump, the mix is vibrated. This section of the form will be re-covered immediately with a double layer of neoprene-coated nylon tarps to be steam-cured. Pours were made only during the day shift, when the air was warmer, and only when temperatures were over 18 degrees.

◄ Superior hold-down devices, which hold strands at one-third points in the girder, are inserted through a base plate to bolt onto a steel box. This box will be bolted between the rails in the casting bed.

The hold-down unit is lowered into place between the rails in the casting bed. Steel bolts will hold the box in place, and the pull will be transferred to the rails. The girder will be formed on the steel plates. ►

of the concrete was changed from the night to the day shift. Winter pouring was done during the day to take advantage of the warmer air temperatures.

To heat the aggregate for the concrete as well as supply steam for curing, the firm added a 150-hp coal-fired boiler to the one already in use. Portable space heaters warmed the steel forms before pours were made. An extra layer of tarps was used to cover girders being steam cured; the two layers of neoprene-coated nylon were separated by wooden frames that provided about 6 inches of dead-air space.

In spite of the extra work made necessary by the cold, the plant was still able to turn out 1,120 feet of girders per day, providing the temperature stayed above 18 degrees. Concrete was not poured when the mercury dropped below this, but stressing, forming, and the setting of reinforcing continued.

### Plant layout

With the help of consulting engineers T. Y. Lin & Associates, Berkeley, Calif., Material Service Corp. of Chicago set up the prestress plant to supply the Illinois Toll Highway Commission with 219,000 linear feet of girders and 52,000 square feet of 2½-inch deck plank. Altogether, 1,800 miles of steel cable and more than 100,000 tons of concrete were needed for the job. Girders and plank were furnished under a $4.2 million contract for the bulk of the nearly 300 prestressed-type bridges on the Illinois Toll Highway. These bridges required from 10 to 177 girders each.

The prestress plant occupies almost all of a 30-acre site adjacent to the company's aggregate-producing plant near Algonquin, Ill., some 40 miles northwest of Chicago. The casting beds and storage yard are set on the level base of a former gravel pit.

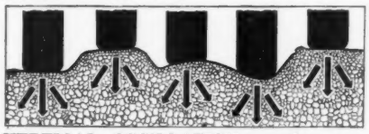
There are six 607-foot-long casting beds arranged in three rows so that the tensioning abutments are at the center of the layout. The anchoring abutments and cable-supply racks are at the extreme ends. The abutments, built integrally with the beds, can withstand pulls up to 2 million pounds. Operation of the plant is flexible, despite the fact that it was initially designed to handle the big concrete girders for the tollway contract.

(*Continued on next page*)


**NEW COMPACTION EFFICIENCY** with **Southwest**

# VERTICAL-PAK SELF-PROPELLED PNEUMATIC TIRED ROLLER

With Southwest VERTICAL-PAK, boulders, curbs and other obstacles are no longer a problem in close work.



VERTICAL OSCILLATION on the rear wheels affords uniform compaction on uneven or rocky surfaces.

Here's a NEW design in Pneumatic Compaction Rollers that brings you VERTICAL OSCILLATION for the first time in Self-Propelled machines! The Southwest VERTICAL-PAK Roller affords VERTICAL action of the rear wheels. This means a constant, uniform wheel load, as well as uniform compaction on uneven surfaces, over soft spots, and where stones or boulders are present in the materials undergoing compaction. The VERTICAL OSCILLATION of VERTICAL-PAK affords new compaction efficiency.

VERTICAL-PAK action reduces tire hazard. Excessive weight on any one tire or wheel is impossible under normal operating conditions. Curbs and other obstacles are no longer a hazard in close work.

Seating arrangement and REVERSE-O-MATIC transmission place operator in a position to see both forward and reverse equally well at speeds in both directions up to 15 mph. Extra strong rear wheels are especially manufactured for this particular machine. Ballast capacity is 105 cu. ft. Individual, SELF-LOCKING differential chain drives to all 5 drive wheels.

Only SOUTHWEST offers ALL of the features found in VERTICAL-PAK. The 11 ton, 11 wheel model is powered by a 50 hp gas engine. Diesel power is optional.

COMPACTION IS BEST WHEN YOU USE SOUTHWEST. Investigate the NEW VERTICAL-PAK today.

**Pneumatic Compaction Rollers • Sheepsfoot Rollers • Rippers • Sprinkler Tanks**

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CONSTRUCTION MACHINERY DIVISION
**Southwest Welding & Manufacturing Co.**
ALHAMBRA, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 226

After tension has been applied to the strands, 30-foot-long cages of reinforcing are pulled out to the casting line on wagons and set in place by an American 395.

(*Continued from preceding page*)

The I-shaped girders turned out for the job varied in length from 40 to 92 feet and in depth from 36 to 60 inches. The larger girders had the upper strands deflected downward at approximate one-third points.

Equipment in use at the prestressing yard of Material Service Corp., Algonquin, Ill., on this job included:

Superior devices to hold down strands at one-third points.

Roebling and American Steel & Wire Co. strands

Rodgers 300-ton hydraulic jacks

General Electric and Hobart 300-amp welders using Airco low-hydrogen 5/32 rod

Form-Crete forms

Master B-125 space heaters

M. Mauritzon & Co. nylon tarpaulins

Homelite and Wyco spud vibrators to consolidate concrete

Kewanee 150-hp steam boilers to furnish steam for curing during winter months

A batch plant, mainly of Butler Bin design, with a T. L. Smith 3-yard tilting mixer

Ford F800 trucks with agitator to transport concrete to the forms

Darex air-entraining agent

Pozzolith, used as a concrete admixture

A Butler building to serve as a cage fabricating shop

**Deflecting strands**

Perhaps the most unusual part of the operation was the method of deflecting the upper group of strands. The 92-foot 48-inch-deep girders had 35 strands of the upper pattern deflected while 44 strands of the lower group were horizontal. At the ends of the girders, strands were jacked up; at the one-third points, strands were held down with special devices. These penetrated the steel plates on which the girders were cast, and were bolted to a steel box. Large sliding bolts held this box secure against rails that were embedded in the concrete. The 7/16-inch strands were continuous for the 607-foot length of the casting bed, but their position rose and fell within each girder on the bed.

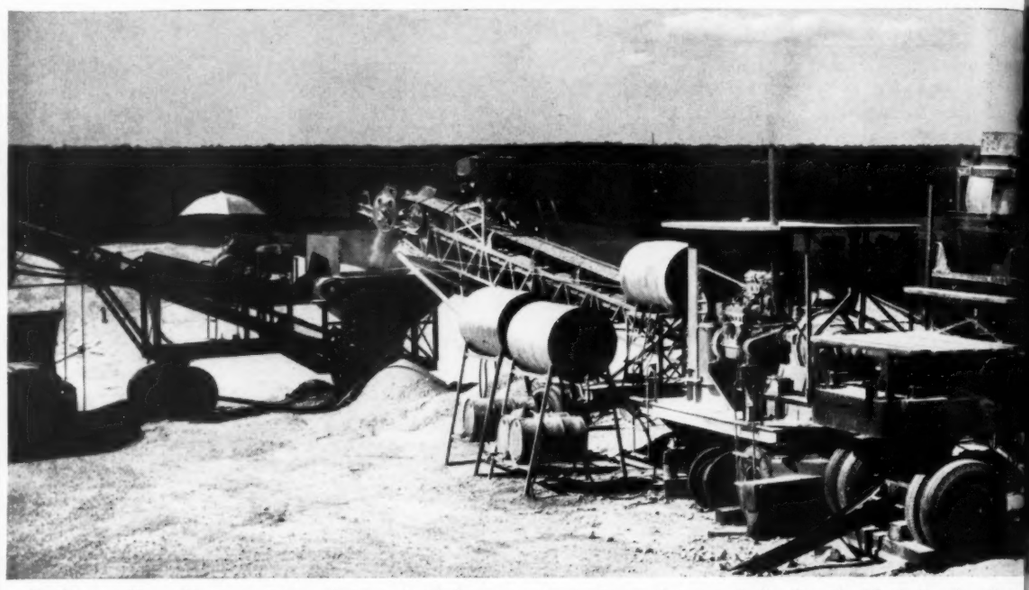
At the ends of the girders, strands were held up by two hydraulic jacks mounted on a steel frame that straddles the casting bed. The 50-ton jacks lifted a T-shaped crosspiece which carried the upper pattern of strands. In addition to holding the strands, the jacks were used to apply the final tension to the upper pattern. The final tension of 19,050 pounds for each of the strands was gained as wires were simply lifted to their final position. Two screw-type jacks held the crosspiece with the strands in position, leaving the frame and hydraulic jacks free for use in another bed.

**Tensioning jacks**

A four-point jacking system applied tension to the strands. Four 300-ton hydraulic jacks with 48-inch ram-travel worked in pairs to control the pull on either the upper or the lower group of strands. Two sets of jacks permitted two beds to be tensioned at the same time.

Small, single-strand jacks applied an initial tension of about 1,200 pounds to the strands. Each strand was then brought to a final tension of 19,050 pounds. On the deflected group, the final tension was gained with the pull-up jacks at the girder ends.

After the strands had been tensioned, bulkhead plates were set in place at the ends of the girders. These

On this portable crushing operation, producing materials for use on a grading and drainage contract for the Missouri Freeway construction project near Joplin, Mo., the W. J. Menefee Construction Co. uses 3 Cat Engines to power this crusher.

# He staked his (business) life o

**This big 100% Cat fleet owner says: "The *dependability* of engine power by Caterpillar has always made it possible to anticipate *true* costs—takes the guesswork out of bidding."**

From a modest beginning as a small contractor, the highly successful W. J. Menefee Construction Company of Sedalia, Mo., has bet its business life on Caterpillar Engines and machines across the board.

"Experience has shown us that we can always rely on Cat Engine power," says Mr. E. W. Menefee, president.

Recently this big spread was responsible for 9 miles of grading and drainage, including the interchange, to join the Missouri Freeway with Oklahoma's Northeastern Turnpike. Besides a variety of modern, heavy-duty Cat Engines to power crusher, shovels and compressors, Menefee is getting this big, tough job done on time with a large fleet of Caterpillar equipment, including DW21s and DW-10s, D9s and D8s (with No. 28 Rippers) and No. 12 Motor Graders.

This contractor's policy of always specifying Cat Engine power and machines—coupled with sound management practices—has paid off in profits. Like other successful contractors, this spread gains solid advantages by relying all the way on Cat equipment. Its reputation and preference by contractors mean pride of ownership, high trade-ins, and an organization that stands behind the product.

Reliably rated Cat Diesel Engines and Electric Sets give more work for each dollar spent for purchase, repairs and operation. Production is maintained at an even level because there is no appreciable letdown in power as equipment ages.

Cat DW21 Wheel Tractors pushloaded by a big D9 work in tough chert conglomerate on Menefee's Freeway job.

Cat Diesel drives a pneumatic compressor drilling blast holes in rock quarry for materials used on the Freeway job.

½-inch plates were slotted vertically to fit the pattern of the strands. The slots were later sealed with masking tape to prevent leakage of concrete.

**Reinforcing steel**

Girder production was speeded by the efficient assembly and placing of the reinforcing cages. The horizontal members and the stirrups were welded into 30-foot-long cages in a nearby building. The steel was welded on jigs by 300-amp machines using low-hydrogen 5/32 rod. At the start of the operation, the members were wired together; later it was found that welding was faster and held the members more securely in place.

The reinforcing was set in place after the final tension had been applied to the strands. Cages were pulled on wagons from the welding shop to the crane which set them in position. The cages were wired together for the length of the girder. Final positioning of the steel was made after the forms were in place.

After cages had been placed, the lower group of strands near the ends of the girders was circled at intervals with steel bands. The banding was specified to prevent longitudinal cracking at the girder ends when the tension was released.

Reinforcing steel for the girders is welded into prefabricated cages in this Butler 20×180-foot building located next to the casting yard. The 30 acres was formerly used by Materials Service Corp., Algonquin, Ill., as a gravel pit.

**Forming**

About 2,000 feet of double steel forms was necessary to keep up with the high production. The 20-foot lengths of forms were tailored to fit the exact dimensions of the 36, 48, and 60-inch-deep girders. The forms met the rigid specifications of the Toll Highway Commission, which state that the cast length of the girder shall be within ½ inch of specified dimension and alignment within 1/16 inch in each 10-foot length or between vertical form stiffeners.

Cranes placed the form panels on the base plates of the casting bed, and workmen followed along to bolt the ends of the panels together. The bottom edge of the form was held in place by adjustable plates. The plates were mounted on large bolts which went through the two rails beneath the girder.

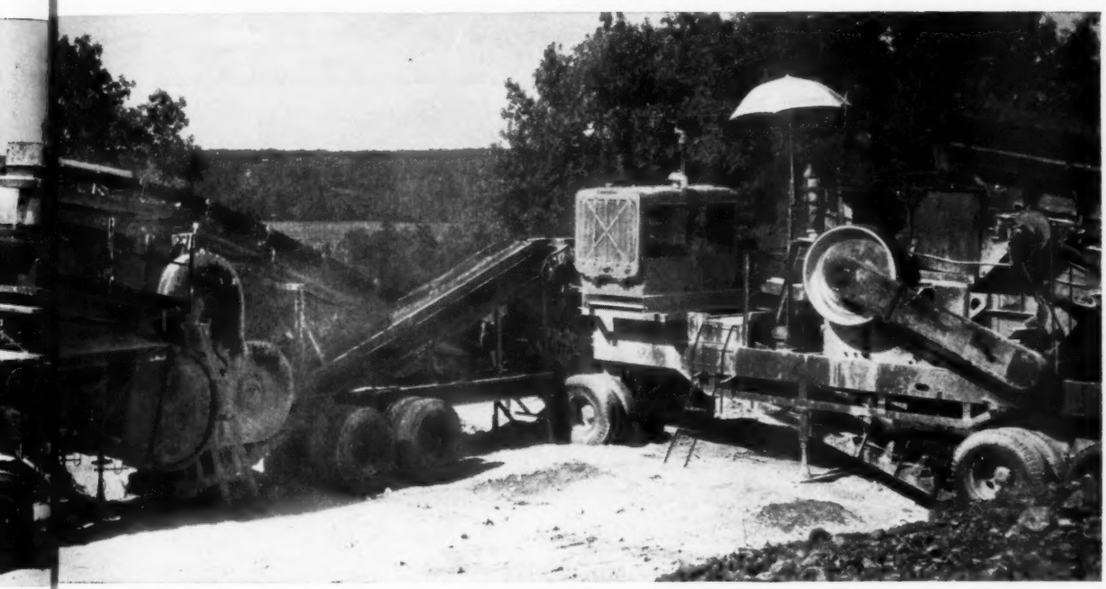
During cold weather, the forms had to be heated before they received the concrete. About an hour before the pour, the forms were draped with neoprene-coated nylon tarps and space heaters were tucked under the tarps to warm up the cold steel. The compact oil-fired units are capable of putting out 150,000 Btu's per hour.

**Pouring and curing**

At a batch plant set up near the edge of the site, heated aggregates were dropped into a 3-yard tilting mixer. Agitator rigs mounted on trucks kept the low-slump concrete in motion during the haul to the casting beds. Concrete was bucketed to the forms at temperatures of from 50 to

*(Continued on next page)*

A 9-ton-capacity Clark fork-lift unloads Ryerson reinforcing near the Butler shop. Steel members are bent at the factory to fit the beams. In the background, completed cages are ready to be hauled to the casting beds.

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Cat Engines mean minimum down time, permitting closer bidding of every job, and their well-known durability can handle the harsh materials and severe job conditions the contractor faces. All of these factors result in lower operating costs than other diesel power plants; and the market value of Cat equipment stays high after normal amortization.

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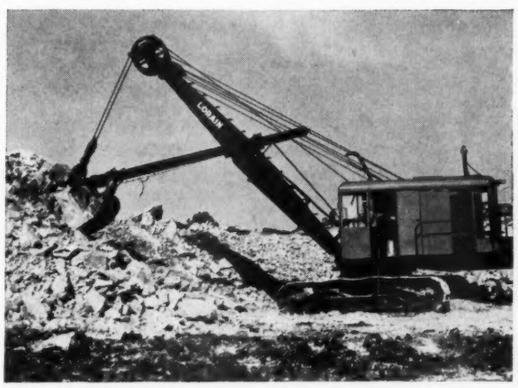

A Cat D337 Engine powers this Lorain shovel feeding rock to Pioneer portable crushing plant — part of the W. J. Menefee Construction Company's big Missouri Freeway linkage project.

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"When *buying machinery* or *preparing a bid* we don't take unnecessary chances. Cat units will pay for themselves in savings alone. Elimination of excessive down time really pays off, and our operating costs are low. Cat Engines are real work horses, producing as rated, day in and day out. Add excellent dealer service and parts availability—even on the old ones—and you have the reason why we are a 100% Cat fleet owner today. We look for realistic value when we buy, and we get it when we specify Caterpillar!"

—E. W. Menefee, president

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Master heaters are used to heat forms before concrete is placed. The workman checks a unit that is partially covered by neoprene-coated nylon tarps. At left are the concrete anchors at the dead end of the bed.

Concrete is brought to the Gar-Wood 1-yard placing bucket by a Ford F800 truck with a 4-yard agitator. The concrete is mixed at the plant; the agitator simply keeps the mix stirred up until it is placed.

(*Continued from preceding page*)

60 degrees, and spud vibrators consolidated the mix.

In the winter, it took a lot of steam to cure the girders and a lot of tarpaulins to cover them. Two 150-hp boilers ate up two railroad carloads of coal a week to furnish steam to the casting beds and the aggregate stockpiles.

Some 89,000 square feet of tarps was used to cover the girders during curing. The neoprene-coated 16-ounce nylon material is made to withstand rough handling, large variations in temperature, and a lot of moisture. Considering the difficult conditions, it held up quite well.

Immediately after a pour, the girders were covered with a double thickness of tarps and the steam was turned on. Recording thermometers at the end of each bed registered curing temperatures, which are maintained at 140 to 150 degrees.

After 6 to 8 hours, the tarps on each beam had to be removed for a short period while forms were stripped. After they were put back over the girder, the curing continued until test cylinders gave a 4,000-psi break. In the winter, steam curing normally continues for about 24 hours after the pour; then the strands are cut.

Two big cranes worked together to lift the heavy girders from the bed to the adjoining storage area. All girders were moved out by pole trailers. Railroad flat cars are also available for transporting members.

#### Concrete specs

During the winter high-early-strength portland cement was used at a concentration of 7¾ sacks per cubic yard. The low-slump mix (3 inches or less) contained an agent to provide 3½ per cent air entrainment. Pozzolith (two per cent) was also used as an admixture. The largest size of aggregate was 1½ inches.

#### Personnel

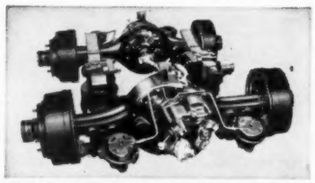
Design and construction of the plant were under the direction of vice president George Lenzie, vice president in charge of operations, George Kirp, and Charles Goodman, new

Whatever the job . . . wherever you do it!

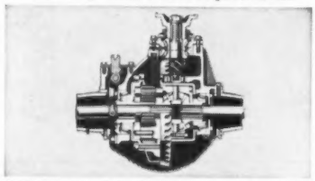
# There's more to look for in Ford's extra heavies for '59

Ford Extra Heavies have proved themselves on every kind of job—you can count on them for *dependability* and *durability*. And in '59, you get high performance at low Ford prices for brand-new reasons! New faster rear axle ratios, new higher capacity axles, and other important options make big-truck operation still thriftier in '59 when you go *Ford*-ward. Send coupon for full information!

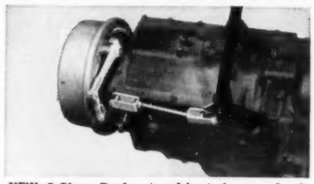
**NEW Tractor Equipment Package** provides complete trailer air brake and electrical connections, meets I.C.C. requirements.



**NEW Ford Tilt Cab Tandems** are available with three tandem-axle capacities: 28, 34, and 38,000 lb. Front axles to 15,000 lb.



**NEW Faster Axle Ratios** team up with Super Duty V-8's for greater gas economy and reduced engine wear. For example, 5.43/7.39 to 1 available in 1100 Series.



**NEW 2-Shoe Brake** (parking) is standard for '59 on all Ford Extra Heavies. Has 50% greater stopping and holding power, requires 50% less effort to operate.

**Tilt Cab Tandem Ford C-950** (above) has hydraulic loader with push-button remote control.

Go FORD-WARD for savings FORD TRUCKS

Steam-cured girders are stripped of the double layer of nylon tarps after test cylinders give 4,000-psi break. Early morning frost on the adjacent line of tensioned strands emphasizes the rise and fall of the top group of wires.

products manager. Stanley Bushneck, assigned as superintendent, was assisted by Charles Kline, Hubert Fudge, and William Morrison. Before completion of the contracts, Bushneck was promoted to construction superintendent, and A. H. Loeffelholz took his place. Charles Hurych is chief engineer.

THE END

## High-early cement speeds concrete setting in winter

A high-early cement, which permitted building operations to continue through the winter and speeded the setting time of concrete by about 50 per cent, has been used for a 20-story office building in Buffalo, N. Y. While high-early-strength cement is more expensive than regular cement, the cost is outweighed by the quick progress that can be made.

D. I. C. Concrete Corp., Elmont, N. Y., subcontractor to Tishman Realty & Construction Co., Inc., New York City, owner and builder of the structure, covered the concrete, after it was poured, with tarpaulins and warmed it with gas heaters to speed up setting time. As part of the winter procedure, the aggregates of the concrete mixture were also heated. Electric vibrators distributed the freshly poured concrete evenly to speed up setting.

Before stripping, the new concrete was tested with a Swiss "gun", a long cylinder containing a spring attached to a short leg at one end. The gun was pounded against the concrete arches and columns, and the rebounds were measured on the "strength" scale on the cylinder. When the scale registered half the final load-bearing strength of the concrete, stripping started.

## Consulting engineers open new firm in California

The newly established firm of Goodenough, Sudman & Overholser, Inc., 1833 Howe St., Sacramento, Calif., now offers complete consulting engineering services which cover investigations, studies and reports, design, construction supervision and inspection, and project administration. This service is geared to hydroelectric projects, irrigation works, municipal water supplies, highway and water tunnels, dams, aqueducts, and similar works.

Principals in the firm are Bertram W. Goodenough, president; Glenn F. Sudman, vice president; and S. Raymond Overholser, secretary and treasurer.

The three men have had wide experience in the heavy-construction field, and have been most recently engaged on the Tri-Dam Project.

## Curtiss-Wright produces construction machinery

Curtiss-Wright Corp., Wood-Ridge, N. J., is expanding its distributor sales and service organization for its new line of construction machinery, formerly sold under the name of Wooldridge. This new program will be carried out by the firm's South Bend Division.

The firm offers self-propelled and tractor-drawn scrapers ranging in size from 7 to 30 cubic yards and rear-dump models in sizes up to 35 tons capacity.

Robert Campello has been made general sales manager and Edward McCartney, product sales manager.

## Apeco creates subsidiary for leasing operations

The American Photocopy Equipment Co., Evanston, Ill., has established a subsidiary to handle leasing and conditional sales of its photocopy machines, binding and punching equipment, and Ply-On laminator. Called Apeco Leasing Corp., the new firm offers a two or three-year lease contract for any or all equipment, or a conditional sales plan based on a minimum of six months or a maximum of twelve months.

FREE—COMPLETE FACTS ON NEW EXTRA HEAVY DUTY TRUCKS
Check Choice of Booklets and Return to:
FORD Division of FORD MOTOR COMPANY
P.O. Box 658, Dearborn, Michigan
Extra Heavy Duty Conventional and Tilt Cab Trucks
Up to 36,000-lb. GVW, 65,000-lb. GCW
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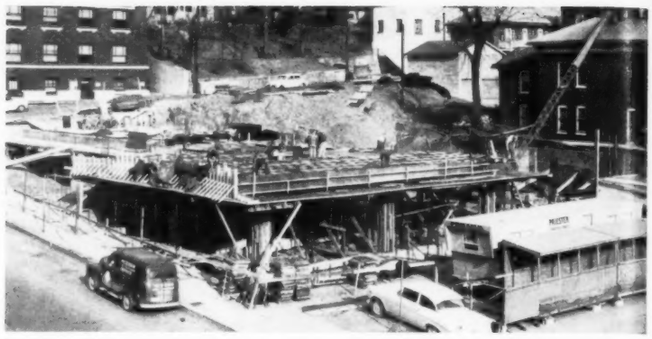
**BRAND-NEW TILT CAB TANDEM FORDS** for '59 combine the easier, more economical maintenance of tilts with high tandem-axle load capacities. Tilt design also permits higher front axle loads, longer body on given wheelbase. C-950 Tandem, above, operated by Fairlawn Supply and Concrete, Akron, has 15,000-lb. front axle, 34,000-lb. rear. Carries up to 6,500 brick, compared to 5,000 on a conventional tandem. Has 401-cu. in. V-8, 5-spd. main transmission, 3-spd. auxiliary, 201-in. wb. GCW (with pup trailer) 72,000 lb.

**K COST LESS** ... *less to own ... less to run ... last longer, too!*

For more facts, use coupon, or Request Card at page 18 and circle No. 228

For winter construction

# A building is bundled in plastic



Shortly after the October start, crews are on the second floor, setting reinforcing steel in joists formed by the steel pans. Note the forming of the cantilevered balcony slab, which extends 6.5 feet out from the column line. The Koehring 304, right, feeds material to the men.

Wrapping a building up as pretty as a Christmas package, construction men on a 3-story structure carried their work through a snowy holiday season.

Wrapping the package took a lot of hard work and resulted in a few frostbitten fingers, but by January, the building was completely protected by a sheath of clear plastic. With this, and the use of winter construction techniques, Priester Construction Co., Davenport, Iowa, lost only three days' working time during the cold winter.

In going up with the floors, the contractor at times poured concrete when the temperature was down around zero. A lot of precautions had to be taken to protect the concrete. The mix was preheated. The area beneath the pour was closed off and heated. Insulated mats were used to top the fresh concrete.

The modern, T-shaped office building, recently completed, is located on a sidehill lot at the corner of 6th and Brady in Davenport, Iowa. The contractor on the $400,000 building, Priester Construction Co., now occupies about one-sixth of the total of 17,500 square feet of usable office space; Priester Realty Co. is the owner.

Designed jointly by John W. Kruse, San Francisco, and Parish & Richardson, Davenport, the structure has architectural features unusual for this section of the country. Perhaps the most eye-catching is the curved masonry wall which dominates one side of the building. Faced with colorful Mexican glass tile, it is in bold contrast to the straight, clean lines of the rest of the structure.

Aluminum and gray glass panels, manufactured by Pittsburgh Plate Glass Co., make up the curtain walls. Cantilevered balcony slabs extend 6.5 feet out from the column line to shade the glass panels. Access to a 21-car parking lot at the rear of the building is gained by driving through the building at street level.

**Construction starts**

Men began work on the excavation in October, 1957, knowing that there

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and
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For high pressure, high temperature water lines . . . for sewage outfall lines . . . for any job requiring fabricated steel or wrought iron pipe or piling of 14" O.D. or larger . . . Posey has the experience, facilities and skilled men to meet your requirements.

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**with a**

**WINKIE Diamond Drill . . .**

**the pint-sized powerhouse that drills *anywhere* at *any* angle.**

Even in the hardest granite, this "carry-in-your-hand" unit will give you capacities up to 200 feet, cores as much as 8 inches in diameter. Five minutes is all it takes to set up.

WINKIE'S high bit-speed range gives you the economies of lower bit wear at higher speeds—reduces diamond costs about one-third. **When the bit is on the bottom, you'll never burn a bit with a WINKIE!**

And mark this: because WINKIE sells for **half** the cost of drills with comparable capacity, it begins paring your drilling costs even **before** you use it!

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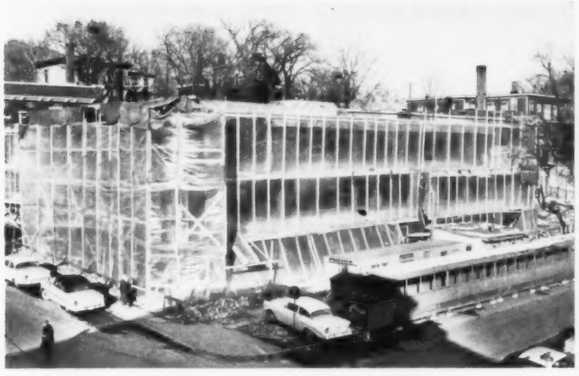
**CANADA: J. K. Smit & Sons of Canada, Ltd., 81 Tycos Drive, Toronto, Ontario.**

**EXPORT OFFICE: Amroeta Company, 50 Church Street, New York 7, N. Y.**

For more facts, use Request Card at page 18 and circle No. 230

By January 7, crews were making third-floor pours. A Lorain motor crane is handling the ready-mix concrete, which was heated at a commercial plant. The 3,500-square-foot area enclosed by Visqueen plastic has an inner wall of canvas.



February 3, and the third floor is under construction. Work is continuing on the exterior walls, which are enclosed in the Visqueen plastic. The plastic is held by double 1×6's, which are simply tied to nailers on the outside edge of the cantilevered balcony slabs.

would be many cold months ahead. For a building with no basement, there was a lot of dirt to get out of the way. The steep sidehill lot made necessary a cut of about 20 feet at the rear of the building. The material was hard silt, and when excavated did not require sheet piling. Taking advantage of the mild fall weather, the men got in the spread footings and the floor slab without having to protect the concrete.

#### Cold weather sets in

By the time work got up to the second floor, cold weather closed in on the job. Armed with rolls of plastic and a carload of insulated mats, the contractor got ready for Old Man Winter.

After the adjustable steel shores were up and supporting the steel floor pans, the space below the area to be poured was enclosed with both plastic and canvas. A .004-inch clear plastic made up the outside curtain, while canvas temporarily formed the inside wall of the shelter. The shelter enclosed an area of about 3,500 square feet, or about one-third of an entire floor. During the pour and for several days after, the area was heated with a space heater. The space heater, with a capacity of 400,000 Btu's kept the temperature at about 50 degrees.

During the pour, heated concrete was placed by a motor crane. With its 100-foot boom and 25-foot jib, the crane was able to reach practically any area in the building. Concrete in the cantilevered balcony slab was poured monolithically with the pan-type floor. No calcium chloride was used in the 4,000-pound concrete.

#### Mats protect concrete

As soon as possible after the concrete was finished, 2-inch insulated mats were laid on the surface to hold in the heat. The 4×25-foot mats were laid side by side to completely cover the fresh concrete.

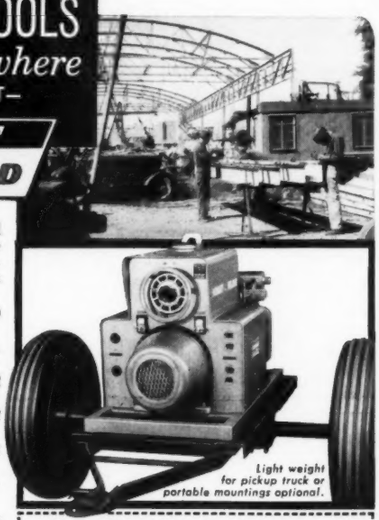
Even though air temperatures got down to zero, the temperature of the concrete beneath the mats stayed at 80 degrees for several days. The 6-mil mats not only held in the heat, but

*(Continued on next page)*


WELD or RUN TOOLS

LIGHTS, MOTORS *anywhere* *with this NEW,* LOW COST—

HOBART ac POWR ac WELD



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Use your own men—No special training or skill necessary. The most versatile piece of equipment you can have to speed work and increase profits.

- **DC WELDING** ranges from 30 to 225 amperes
- **100% DUTY CYCLE:** 200 amps. at 25 volts
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You'll want to see and try this new combination DC Arc Welder and AC Power Unit.

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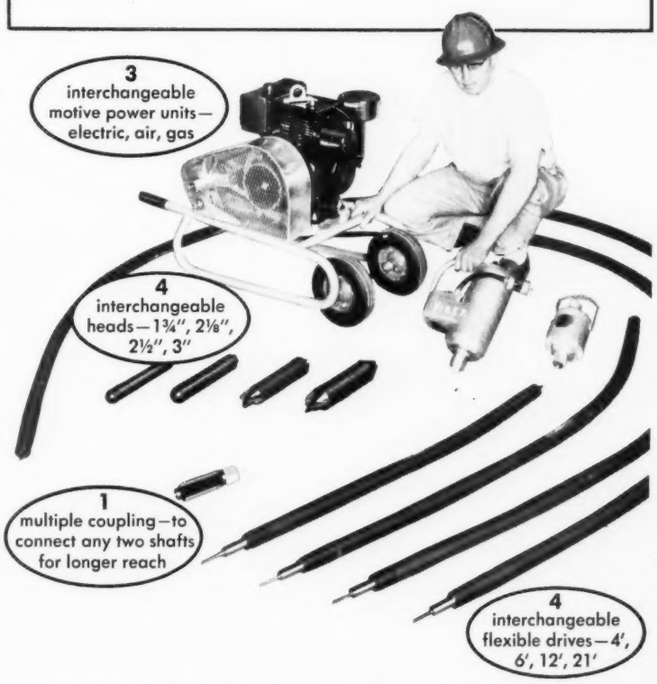
For more facts, use coupon, or Request Card at page 18 and circle No. 231



**64 Concrete Vibrator Combinations from 12 Basic Components!**


3 interchangeable motive power units—electric, air, gas
4 interchangeable heads—1¾", 2⅛", 2½", 3"
1 multiple coupling—to connect any two shafts for longer reach
4 interchangeable flexible drives—4', 6', 12', 21'

**Quickly and Easily, in the Field,** your men can assemble any one of 64 different concrete vibrator combinations from the 12 basic components shown above!

Because the Viber line is the most versatile line available, Viber flexible-shaft internal vibrators help you reduce your capital investment—reduce your day-to-day operating and maintenance costs—meet *all* your concrete vibrating needs.

*Contact your dealer or write direct for detailed information.*
*Viber Company, 726 South Flower Street, Burbank 29, California.*

VIBER CO. VIBRATORS

*Pioneers and leaders in the manufacture of vibrators.*

For more facts, use Request Card at page 18 and circle No. 232

Project manager W. K. "Wally" Priester, left, and Frank Covemaker, superintendent, oblige the photographer in front of the modernistic arc wall. The wall rests on a concrete beam that is cantilevered out from three columns.

they stood up well under many reuses. They were used nine times for this building and were still in good enough shape to take on another job of equal size.

#### Building gets plastic overcoat

After a floor had been completed, it was closed in around the outside with plastic. The nailers on the cantilevered balcony slabs proved convenient for holding the plastic in place. The plastic was sandwiched between two 1×6's that ran vertically between the cantilevered slabs. With the plastic sheath in this position, crews were protected from the weather, even when they worked on the exterior.

By January, the entire building was wrapped in a plastic overcoat and ready for the worst part of the winter. With the space heater and numerous salamanders heating the area, work continued in natural light on the exterior masonry walls as well as on the interior partition walls. In spite of the wind and general construction hazards, the plastic overcoat lasted through the winter and needed very little patching.

#### Fast forming on columns

All the exposed columns were formed with Sonotubes. Their use not only simplified the forming, but also eliminated the need for a finish plaster on the column. Priester estimates that, compared to conventional columns, the Sonotubes saved him $1,800 in construction costs.

In the parking and driveway area on the ground floor, the bases of the columns were enclosed in ⅛-inch galvanized steel for protection against car bumpers. The galvanized sleeves were made up to fit exactly against the inside walls of the Sonotubes. With a perfect fit, the galvanized steel on the finished columns came out neat and clean.

A unique "open" wall was built to enclose a part of the parking area on the first floor. It is of concrete chimney blocks laid sideways, and the construction makes an attractive and inexpensive wall.

*Protecting both crews and concrete against winter weather on the Priester job was a Visqueen .004-inch clear plastic that made up the outside curtain of the enclosure. Canvas formed the inside wall of the shelter. Heat was supplied inside the building by a Master B400 space heater and a number of salamanders. The newly finished concrete was protected by 2-inch insulated mats of black Polyglas made by A. H. Bennett Co., Minneapolis.*

*Concrete placement was handled by a Lorain motor crane with a 100-foot boom and 25-foot jib. A Koehring 304 backhoe was used to excavate the sidehill cut for the structure, and Sonotubes were used to save money and to simplify forming of the exposed columns.*

#### Personnel

W. A. Priester is president of Priester Construction Co. His son, W. K. Priester, was project manager on the building, and Frank Covemaker was superintendent.

THE END

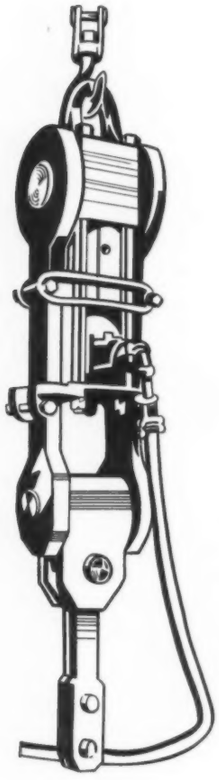
## Properties of compacted soil-cement mixtures

Representative data on modulus of rupture, modulus of elasticity, Poisson's ratio, and compressive strength of several soil-cement mixtures are presented in "Strength and Elastic Properties of Compacted Soil-Cement Mixtures", by Earl J. Felt and Melvin S. Abrams. This bulletin, published by the Portland Cement Association, is an authorized reprint from the American Society for Testing Materials' special technical publication No. 206.

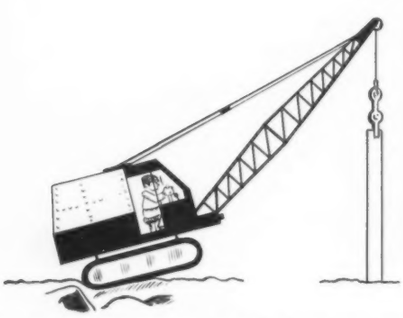
Methods are described for molding uniformly densified beams for flexure tests and cylinders for compression tests. Methods for measuring deflections in beams when loaded in flexure are also detailed, as well as those for measuring axial and transverse deformations in cylinders when loaded in unconfined compression. The effects of the type of soil, cement content, and length and type of curing on the structural properties are shown.

Bulletin D16 is available without charge from the Development Department, PCA, 33 W. Grand Ave., Chicago 10, Ill.


McKIERNAN-TERRY PILE EXTRACTORS



WHERE THE JOB INCLUDES THE EXTRACTION OF HEAVY, MUTILATED PILES FROM TOUGH EMBEDMENTS, THE McKIERNAN-TERRY PILE EXTRACTOR CAN INSURE SWIFT, PROFITABLE JOB COMPLETION. ORDINARILY A DIRECT PULL OF MANY TONS FROM A BOOM OR STRONGBACK RIG WILL NOT DISLODGE LARGE-MASS PILES FROM COHESIVE SOIL WITHOUT ADDITIONAL SHARP VIBRATORY MOTION FROM A STRONG EXTRACTOR. THE McKIERNAN-TERRY MODELS E2 AND E4, RATED RESPECTIVELY AT 50 AND 100 TONS OF CRANE PULL, EXCEL AT THIS JOB SINCE THEIR RUGGED CONSTRUCTION PERMITS THE USE OF EXTREMELY HEAVY CRANE FORCE FOR RAPID EXTRACTION. BOTH MODELS OPERATE ON EITHER STEAM OR AIR, AND ARE DESIGNED FOR QUICK CONNECTION TO THE PILE, PLACEMENT OF THE EXTRACTED PILE AND DISCONNECTION. FURTHER DATA UPON REQUEST.



McKIERNAN-TERRY CORPORATION

82 RICHARDS AVENUE (McK T) DOVER, NEW JERSEY

MAKES ALL TYPES AND SIZES OF PILE HAMMERS & EXTRACTORS

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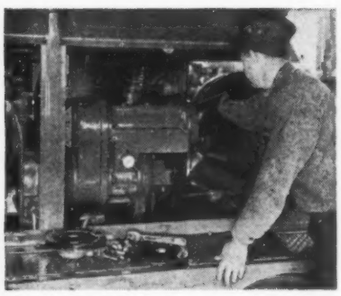
*Now being told on the inside...*

# THE BLUE BRUTE ROTARY STORY

all about the 5 big benefits of the portable compressor with the exclusive over/under design ☞

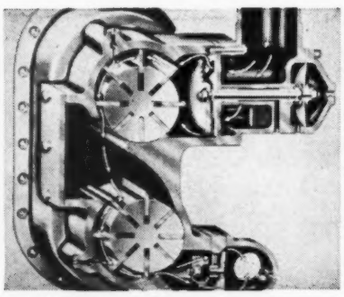
For more facts, turn the page →

# ONLY BLUE BRUTE

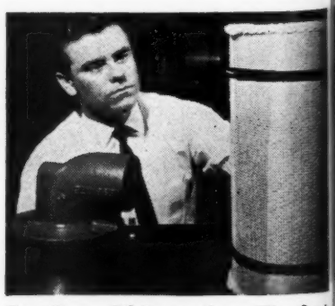


**Accessibility**—All the principal working parts of a Blue Brute rotary can be removed and replaced in just 40 minutes with standard tools! The reason is Over-Under Design which keeps the outboard end of each cylinder exposed. You can check it on the spot and make adjustments without delay.

**The Clutch**—Unlike most rotaries, a Blue Brute's clutch allows you to warm up the engine *without engaging the compressor.* Less strain on the engine means easier starts, less wear and tear, years of extra life. As shown above the clutch is easy for the operator to engage and disengage.

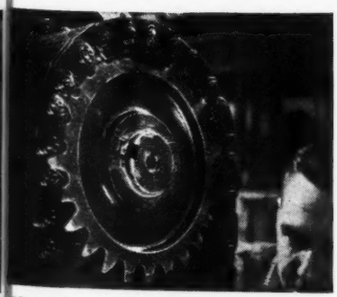


**Self-Draining Cylinders** permit gravity flow of oil from low pressure cylinder through the interstage chamber, through the high pressure cylinder, and out the discharge to the oil reservoir. Oil cannot be trapped in cylinder low spots during shutdown. No chance for sludge or tar clogging the compressor.



**Two-Stage Oil Separation**—The first stage is a Vortex separator in the compressor discharge which removes 95% of the oil. (In the 125′ rotary a velocity change elbow is used.) The second stage is a vertical filter located in the air receiver. This is a long-life filter, easy and inexpensive to renew.

# EOFFERS THE BIG 5 thanks to exclusive over/under* rotary compressor design



**Chain Drive**—Driving power, from the high pressure rotor shaft to the low pressure shaft, is a strong silent chain drive. Based on actual field experience, this drive has a predicted life in excess of 20,000 hours, or 10 hours a day, 200 days a year, for more than 10 years!

**Over/under design is a unique method of construction that puts the second stage compressor cylinder directly under the first stage. It is an exclusive Worthington development that benefits you five ways.*

Compare the Blue Brute rotary compressors with other leading units, feature for feature. Only the Blue Brute has the big 5 benefits. Blue Brute rotary compressors are available in 125′, 210′, 315′, and 600′ sizes from your nearby Worthington Blue Brute distributor. Ask for a demonstration. Worthington Corporation, Portable Compressor & Contractors' Tool Division, Holyoke, Mass. In Canada: Worthington Ltd., Brantford, Ont.

60-7

**WORTHINGTON**

For more facts, use Request Card at page 18 and circle No. 234

# Insulated forms, heated concrete keep bridge job moving in winter

Insulated forms are assembled near the site of one of the three bridges. Warmly clad carpenters are cutting form lumber with a Skil saw.

Excavation of a sheet-pile cofferdam is handled by a Michigan T25 truck crane with an Owen clam. A Rex pump, right, keeps the excavation dry.

In the tight quarters of the column footing for the railroad bridge, a workman with an Ideal wire reel at his belt wires reinforcing steel.

***Concrete is poured at air temperatures of 22 degrees to form columns for three bridges being widened***

Bridge workers felt the biting cold of a Michigan winter as they widened three spans on U. S. 31 near Holland, Mich., but fresh concrete placed in insulated forms stayed at Florida temperatures.

Even though pours were made with the mercury 10 degrees below freezing, the heat of curing soon brought the temperature of the concrete up to more than 90 degrees F. In fact, highway engineers were concerned that concrete would get too hot (over 110) and prevent proper curing. To keep the curing temperature down, the contractor did not allow the preheated mix to get much over 60 degrees.

Working through an unusually cold and snowy winter, L. W. Lamb Co., Holland, completed foundation work on the widening of three bridges on U. S. 31 near the tulip city. The winter work on the $506,032 contract permitted steel to be set in April and the three bridges to be completed last month.

The use of insulated forms has only recently been approved by the Michigan State Highway Department. This has lowered the cost of winter construction to the point where 75

NEW • • • LOW COST

**2-WAY RADIO**
***can be installed in***
**ONE MINUTE**

Temporary installation of 2-way radio in any car for emergencies or during heavy traffic load periods can be accomplished with the new Industrial Radio Portable/Mobile in 60 seconds.

The Portable/Mobile is a completely new design to meet the combined problems of reducing the cost of radio communication and the ability to transfer equipment quickly from one vehicle to another by unskilled personnel.

The Portable/Mobile is the newest product of the manufacturers of the famous Pak-Fone Portable and the powerful Volunteer Communication Receiver, both in wide use in Public Safety Services and in industry.

**Nationwide Sales and Service**

**More Features Than Mobile Units Costing Half Again As Much!**

- Transistorized Power Supply
- Powerful Transmitter and Sensitive Receiver in One Compact Self-Contained Unit
- One Minute Installation
- Low Battery Drain
- Attractive Chrome Plated Steel Case

**See your local Industrial Radio Dealer or write for complete technical data**

**INDUSTRIAL ir RADIO CORP.**
462 N. Parkside Ave., Chicago 44, Illinois

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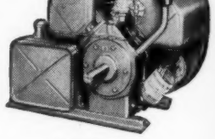
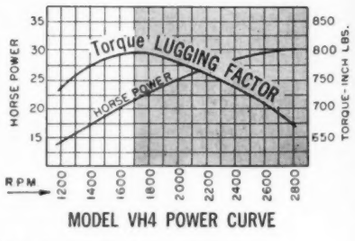
# 30 "HORSES" with a high LUGGING FACTOR



***The Model VH4***
**WISCONSIN** *heavy-duty Air-Cooled* **ENGINE**

It's "heavy-duty" in fact as well as in name. It's built for rugged field service under *your conditions*, no matter how tough they may be.

One of the outstanding characteristics of this engine is its bulldog LUGGING FACTOR . . . the ability to *hang on* and keep your equipment going under suddenly increased loads that would most likely stall other engines of comparable piston displacement.



MODEL VH4 POWER CURVE

With a 107.7 cu. in. piston displacement the V-type 4-cylinder Model VH4D "Wisconsin" delivers 30 hp. at 2800 rpm. with a torque of 675 inch-lbs. Working against peak loads, this engine will keep on slugging away against an rpm. slowdown from 2800 to 1700 rpm., reaching maximum torque at this low speed.

In terms of *power service* to the user, this simply means that your Wisconsin Engine is designed to provide dependable load-holding power *at low engine speeds*. This, in turn, means fewer shutdowns, less wear and tear, more usable power and more versatile performance for your dollar investment.

**The high LUGGING FACTOR is one of the basic characteristics that makes Wisconsin Engines worth more . . . one of the reasons why it pays to specify "WISCONSIN" for your equipment.**

**WISCONSIN MOTOR CORPORATION**
World ...orges Builder... of Heavy Duty Air-Cooled Engines
MILWAUKEE 46 WISCONSIN

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A Power Horse four-wheel-drive tractor pulls the Aeroil heater unit close to the footing excavation. Warm water from the heater melts ice on the concrete seal before the column footing is poured.

Painters working on the rolled-steel girders of the bridge over the railroad have only to pull the scaffolding along as they work. The Swing-Lo scaffolding has clamps with rollers. The four steel scaffold hangers which support the platform can also be adjusted up and down, and to fit different sizes of I-beams.

bridges were built this past winter at the contractors' choice and without extra expense to the department. In past winters, only a few structures have been built, and these involved extra money.

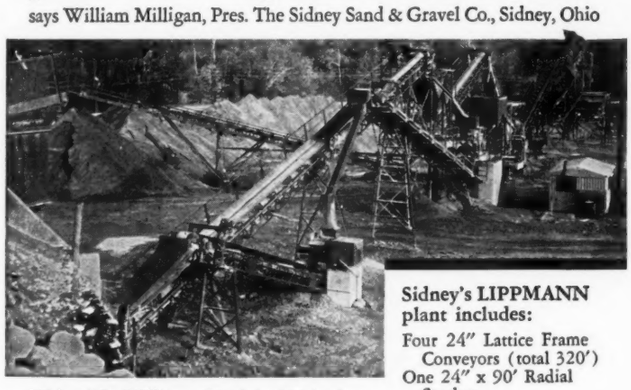
The cost of winter construction compared to summer work is difficult to estimate. According to L. W. Lamb, president of the company, over-all cost of construction during the winter runs roughly from 7 to 10 per cent higher. In winter, labor costs are somewhat reduced because there is little overtime pay. Lamb believes that the greatest expense is caused by the loss in efficiency of men trying to work in cold weather.

Normally during the winter, L. W. Lamb Co. cuts its working force by about half and keeps moving on only half the work. In this way, the company is able to retain key personnel

(*Continued on next page*)


## "Our LIPPMANN crushing and washing plant *still* 'top-notch' after 3 years"

says William Milligan, Pres. The Sidney Sand & Gravel Co., Sidney, Ohio



Writes Mr. Milligan, *"Back in 1954 when we made our final plans for installing an improved completely new crushing and washing plant here at Sidney, we naturally wanted the best machinery we could get to fit our plans. After considering a variety of pit equipment, we decided on using Lippmann. Your equipment was new to us so we did not want to write you prematurely about it. However, now after three years service, we can say that we truly have not regretted our decision. We get 150 tons of crushed, screened, and washed* high-quality material *per hour on the average and reach peaks as high as 200 tons. The ability of your equipment to produce like this along with the excellent service it has given makes it top notch in our opinion."*

**Sidney's LIPPMANN plant includes:**

Four 24" Lattice Frame Conveyors (total 320')
One 24" x 90' Radial Stacker
Four Screen-all d.d. screens — 3' x 12' to 4' x 14'
One Screen-all s.d. screen 3' x 4'
One 15 x 24 Rock Ram Jaw Crusher
One 15 x 36 Grizzly King Jaw Crusher
One 30" x 5' Reciprocating Plate Feeder
One 30" x 25' Single Screw Fine Sand Classifier
Four 40 yd. Single Compartment Bins
One 25 Yd. Single Compartment Bin.

**You'll like LIPPMANN too!**

This same complete Lippmann-engineered planning and manufacturing service is now available to help you keep competitive in quantity, quality and cost. Whether it's complete portable or stationary crushing or washing plants, or individual components, it will pay to contact your local Lippmann Dealer, or Lippmann Engineering Works, Inc., 4637 W. Mitchell St., Milwaukee 14, Wisconsin.

1900-58-1

LEW LIPPMANN SINCE 1923
CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS

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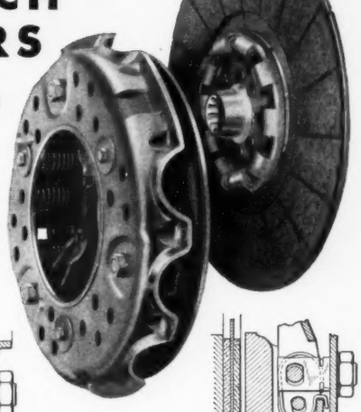
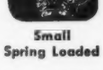
# ROCKFORD

## PATENTED CLUTCH LEVERS

**Reduce friction and wear • Improve clutch release action • and Prevent lever throw-out**



Patent No. 2818952


Small Spring Loaded

Heavy Duty Spring Loaded

Oil or Dry Multiple Disc

Heavy Duty Over Center

Power Take-Offs

Speed Reducers

Patented rolling fulcrum pin action, in the release lever, results in much less friction and wear, and smoother release operation in this clutch than in some other types of clutches. Pin automatically returns to original position. Carefully balanced levers avoid lever throw-out at high speeds.

**SEND FOR THIS HANDY BULLETIN** Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

**ROCKFORD Clutch Division BORG-WARNER**
314 Catherine St., Rockford, Ill., U.S.A.
Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

# CLUTCHES

For more facts, use Request Card at page 18 and circle No. 238

(Continued from preceding page)

The Butler 2-compartment batch plant and Butler 200-barrel overhead silo are enclosed against the 25-degree cold. Heated aggregates are fed to the plant, while an International dump truck picks up cement.

through the off season. With only half the equipment working, time can be taken to overhaul units in need of repair. Last winter was an exception, and the company kept going full force on two good-sized bridge contracts.

One covered the widening of a group of three bridges east of Holland on U. S. 31, which is having two lanes added for a 9-mile stretch. Of the three bridges, one is a 3-span 240-foot river crossing, one is a 5-span 212-foot bridge over a railroad, and one is a 3-span 129-foot county road crossing. On all bridges, steel girders support a reinforced-concrete deck. Each widened deck butts up against the original construction at the approximate center of an 8-foot mall, and each widened section carries a 42-foot roadway.

#### Coordinate work on three spans

The start of work on the three bridges coincided with the start of winter. With a crew of about 30 men, project manager H. J. Brown organized the job so that excavation and foundation work could go on at about the same time on all three bridges. Since there was only a short distance between bridges, it was little trouble to shift men and equipment from structure to structure.

#### Forming

The column forms were made up in five boxes that could be adapted to the 5-column piers of both the railroad and county road bridges. Two additional forms were necessary for the larger columns of the river bridge.

Each form was built up as a unit before being placed in position. For the 5-column piers, the 3-foot-square boxes were built to a height of 16 feet. The ¾-inch plywood was backed by 2×6 studs on 1-foot centers. Double 2×6 walers on 2-foot centers held the forms together.

Crews saved the tie rods for future use by positioning them outside the forms between the plywood and the stud. Filling the gap between these two members was an additional strip of plywood. The tie rods were screwed tight with handle washer clamps.

On the column forms, 2-inch-thick Balsam-Wool mats backed the plywood between the vertical studs. The wood-fiber insulating material was covered and bonded to an asphalt-impregnated Kraft liner. The flange-like extensions of the liner made it possible to nail the 1-foot-wide mats between the studs. According to the superintendent, the cost of the insulation plus the labor to install it ran about $2.50 per square yard of form.

With a moderate amount of care, the insulated forms can stand quite a bit of rehandling. In building the railroad and the country road bridges, the five forms were re-used about eight times.

#### Concrete

On many a frosty morning when the temperature was down to about 25 degrees, the contractor's batch plant dropped out steaming loads to the waiting truck. The compact little plant set up on the job contained a 2-compartment aggregate batcher and an adjoining 2-silo cement plant.

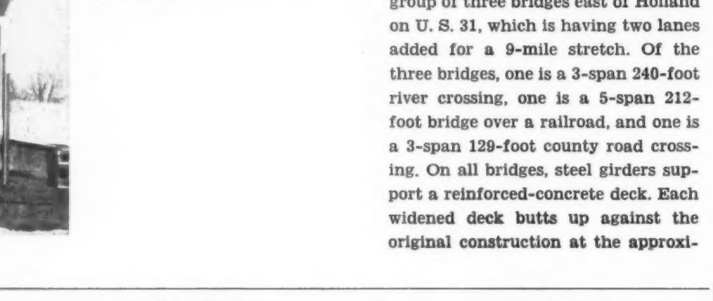
The sand and aggregate stockpiles near the plant were heated from below by steam jetted through holes in a network of pipes. The steam, which brought the temperature of the aggregate up to about 60 degrees, was piped in from an oil-fired 30-hp boiler.

The cement used in the mix contained an air-entraining agent. During the cold weather, however, it was necessary to add Darex to the agent in the cement to get the necessary percentage of entrained air. There


# Putting a "Hole" Through a Fill?

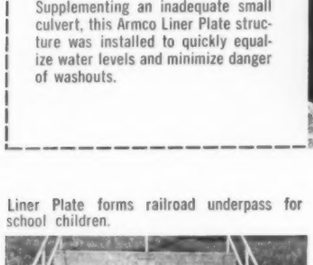
PROVED Pd DURABILITY

Near Bonners Ferry, Idaho, the Great Northern's main line track extends along a river that sometimes floods lowlands on the other side of the fill. Supplementing an inadequate small culvert, this Armco Liner Plate structure was installed to quickly equalize water levels and minimize danger of washouts.

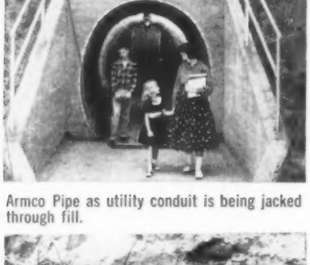



Liner Plate forms railroad underpass for school children.

Armco Pipe as utility conduit is being jacked through fill.



MULTI-PLATE Pipe installed for drainage under new railroad.



## You can do it quickly and easily with a durable Armco metal product

It often happens that a tunnel, conduit or underpass is required through a railroad fill. Usually, the best solution is an Armco Liner Plate structure. The reason? Pound-for-pound, Armco Liner Plates are the strongest made. And the installation can be made without disturbing the safety and movement of surface traffic.

Assembly is simple; all bolting is from within the structure. One man can carry, handle and install plates. Installation keeps pace with excavation. Armco Liner Plates are supplied in a wide selection of sizes and shapes.

Depending on conditions and size requirements, Armco Corrugated Metal Pipe or MULTI-PLATE® Pipe may also be utilized for tunnels or conduits through railroad fills. Installation may be open-cut, or by jacking. Wide range of sizes.

You can easily install any of these structures. Or, if you prefer, the job can be handled by Armco Construction Department on a fixed-price, subcontract basis.

* * *

These structures represent just one group in the more than 30 Armco products for engineering construction. Fill in and mail the coupon for more data. Armco Drainage & Metal Products, Inc., 5948 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

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ADDRESS_____
CITY_____ ZONE___ STATE_____

Get Your FREE Manual!

For more facts, use coupon, or Request Card at page 18 and circle No. 239

Lower sections of columns were poured without insulated forms, but they were partially backfilled and their tops enclosed in hay held in place by U. S. Rubber vinyl-coated nylon.

Working in sand which does not hold the frost, an Allis-Chalmers HD-21 push-loads a LeTourneau-Westinghouse Model B scraper with material to build up the approaches and the areas between the three bridges.

was no need to add calcium chloride to the concrete, since forms were insulated.

From the plant, dump trucks carried the batches to a mixer stationed near the pour. The road paver had been grinding out concrete for a number of years, but it was still going strong. A crane bucketed concrete from the mixer to the forms.

Warm water for the concrete was supplied to the mixer by a gas-fired heater. The heater, capable of warming 1,500 gallons per hour to 100 degrees, received water from a nearby creek. In freezing weather, the water was also used to heat the inside of the forms and thaw out the seal on which the footing was poured.

After the column was poured, the exposed concrete on the top was covered with hay. Although the time concrete remained protected by the forms varied with the weather, it was usual to strip forms in five or six days. Crews followed the good practice of cracking forms a day before they were removed so that concrete was able to cool gradually.

#### Excavation

Cold-weather excavation of the footings was no problem, since the sandy material did not hold the frost. All of the holes were dug with a clam working in an interlocking sheet-pile cofferdam. The excavation went down to hard sandstone, which at its deepest lay about 17 feet below the surface. Before a footing was formed, a concrete seal was poured at the bottom of the cofferdam. Formwork for the footing was not insulated, but the lower part of the cofferdam was flooded to protect the concrete from freezing.

#### Approach fill built in winter

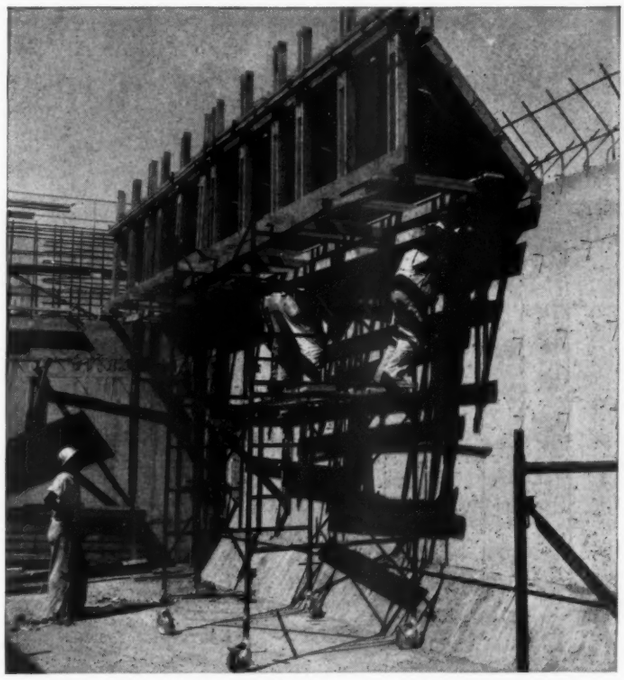
Dirt-moving in January is a rare sight in northern states, but along the sandy shore line of Lake Michigan it is quite common. Unlike clay, the sand does not hold the frost and can be loaded easily with scrapers.

Working under a subcontract, Canonie Construction Co., South Haven, Mich., moved about 54,000 cubic yards of sand to build the greater part of the approach fills to the three bridges. The material was hauled from a mile-distant borrow pit by a fleet of six scrapers.

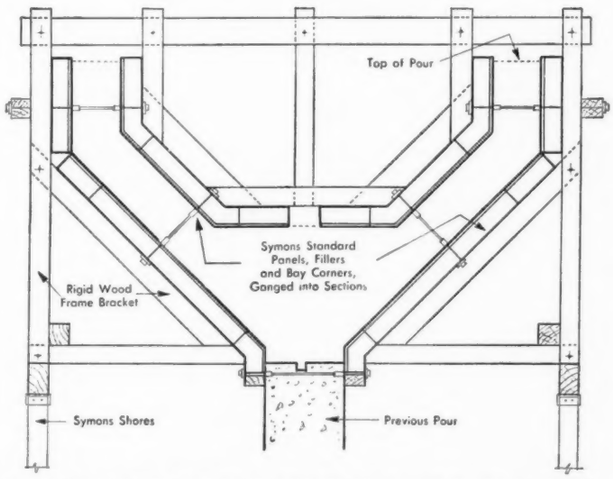
In the borrow pit, one tractor push-

*(Continued on next page)*


# *Gang Forming Licks "Y" Wall Problem*



Workmen on Columbus sewage extension job are putting a gang forming section into place for a pour with aid of rolling scaffolding. Ganged section was 16 feet long.


Top of Pour
Symons Standard Panels, Fillers and Bay Corners, Ganged into Sections
Rigid Wood Frame Bracket
Symons Shores
Previous Pour

Typical "Y" wall section in which Symons standard panels, fillers, inside and outside bay corners, which were eight feet long, were ganged in 16 foot sections.

**Pays Off in Quality Pours, Speed and Reduced Costs**

***2,665 lineal feet of "Y" walls and half "Y" walls,*** with 16'9" high walls on a tank addition to a sewage treatment plant—that was the pouring problem faced by contractors, Wander & Mason of Worthington, Ohio.

***They solved the problem*** by pouring the walls in three lifts with the forms ganged for the final "Y" and half "Y" pours. The tank was 485 feet long and 120 feet wide with five 485 foot "Y" walls in the tank.

***On the "Y" walls*** Symons standard panels, fillers, inside and outside bay corners, which were eight feet long, were ganged in 16 foot sections and handled either by crane or rolling scaffolding. Ganging the forms licked the problem. Quality of the pour was excellent. Speed of erecting and stripping reduced cost appreciably. One 16-foot outside section was stripped, moved to the next wall section and reset by three men in 20 minutes.

***Rigid frames to brace the ganged forms*** were designed by Symons engineers and representative Rapid Construction Equipment, Inc., and built on the job site by the contractor. The outside "Y" wall form section was held to the previous pour by anchor bolts and supported by Symons Shores spaced four feet on center at the outer extremities of the bracket. Additional shores were used beneath the bracket to supplement the anchor bolts near the main wall.

***Inside forms were completely ganged*** and before pouring were bolted to the outer vertical members of the outside frame. This method held the inside forms in position along with the assistance of the coil ties which were spaced on four foot centers. This prevented the inside from floating while pouring.

***Symons Forms, Shores and Column Clamps*** can be rented with purchase option. Information on Symons products available upon request.

Symons

**SYMONS CLAMP & MFG. CO.**
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**Warehouses located in California, Kansas, Minnesota, New Jersey, Oregon.**

**Sales Offices and agents in principal cities.**

MORE **SAVINGS** FROM **SYMONS**

**For more facts, use Request Card at page 18 and circle No. 240**

Forms with Balsam-Wool 2-inch insulation are better protected against the cold than superintendent Jim Lamb.

**Equipment on Michigan bridge job**

Balsam-Wool insulation mats
Williams tie rods, screwed with Universal handle washer clamps
A Skil saw, and a No. 5 saw rig made by Durex Mfg. Co. and powered by a Wisconsin engine
U. S. Rubber vinyl-coated nylon
A Vulcan 4,000-pound drop hammer
A Michigan T25 truck crane with an Owen bucket
A Rex 2-inch pump
A Butler batch plant
A Cleaver-Brooks 30-hp oil-fired boiler
International trucks
A Multifoote 27E paver, supplied with heated water by an Aeroil gas-fired heater
A Model C and 5 Model B LeTourneau-Westinghouse scrapers
An Allis-Chalmers HD-21 tractor
A Caterpillar D8 tractor
An Austin-Western motor grader

loaded the scrapers. On the fill, the material was leveled by a tractor-dozer. Equipment operating on the fill gave it the necessary compaction of 95 per cent.

**Personnel**

Supervising the project for the highway department were project engineer Ernest Malkewitz, assistant project engineer John McLaughlin, and bridge district engineer John Hautala.

Out in the cold for the L. W. Lamb Co. were Jim Lamb, general superintendent, and Herbert "Brownie" Brown, project manager. No one on the job disagreed with the sign in Brownie's trailer: "Anyone who enjoys work can certainly have a hell of a good time in this institution."

THE END

## Madsen Works appoints

Joseph S. Crevoi has been appointed a district representative for the Madsen Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., La Mirada, Calif. He will cover western Pennsylvania, West Virginia, Ohio, Indiana, Kentucky, and the lower Michigan peninsula for the firm, which manufactures asphalt plants and asphalt-plant equipment.

## New sled-mounted shelter tested by Army engineers

A new and improved line of sled-mounted shelters, called Wanigans, for personnel aboard tractor-drawn snow trains in frigid climates has been developed by the Research and Development Laboratories, U. S. Army Corps of Engineers, Fort Belvoir, Va. The units are for the U. S. Army Transportation Corps, and are being tested on the Greenland icecap.

There are three units in the new Wanigan line: a 24-man bunk or mess unit, a 12-man bunk or mess unit, and a 4-man reconnaissance unit. They differ from previous Wanigans in design details.

The large unit measures 36 feet long, 10½ feet wide, 7 feet 10 inches high, and weighs 10,000 pounds, less chassis and sled, when used as a bunk unit. It weighs 11,000 pounds when used as a mess hall.

The medium and large-size Wanigans are constructed of stress cover plywood panels 2 inches thick with ¼-inch plywood faces and Fiberglas insulation in the panel cavity. The small units are made of plastic panels 2 inches thick with plastic-Fiberglas cloth cover bonded to a single veneer of plywood; this, in turn, is bonded to a 2-inch Styrofoam core.

## Two-way radios on pike's snow-removal equipment

The Pennsylvania Turnpike Commission has authorized the General Electric Co., Syracuse, N. Y., to install 211 two-way radios in snow-removal and maintenance equipment. This will enable the units to be in touch with 38 interchanges, 19 maintenance sheds, 8 tunnels, state police, and authorized service equipment patrolling the turnpike.

When the new equipment is installed, at a contract price of $87,102.91, there will be nearly one two-way radio for about every mile of the 470-mile pike.


27 ton "EUCLID"

MODEL R-27

325 or 335 h.p. . . . Torqmatic Drive . . . 18.00 x 25 tires

Model R-27 is a new size in the complete line of Euclid Rear-Dumps—rated payload is 54,000 lbs. This off-highway hauler incorporates the job-proved components which have made Euclid Rear-Dumps the outstanding choice of contractors, mines and quarries.

With either 325 h.p. GM diesel or 335 Cummins engine, the Allison Torqmatic Drive makes maximum use of the power for faster hauling cycles. Converter lock-up in the 4-speed Torqmatic permits 34 mph speed with full payload and efficient performance on long, high speed hauls.

Standard 18.00 x 25 tires on all four wheels assure the traction and load carrying capacity needed for moving 27-ton payloads on tough hauls. Standard body is rated at 18 cu. yds. struck —quarry type body is also available. The R-27 is equipped with oil retarder for safer, more economical braking on jobs with steep down-grades on the loaded haul.

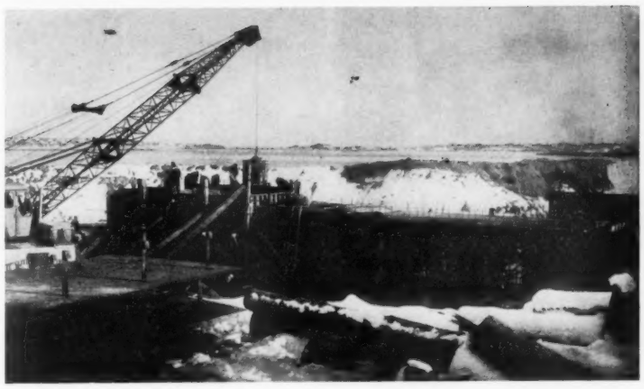
See your Euclid dealer for detailed specifications on this new 27-ton Rear-Dump . . . it's a good example of the advanced design that makes Euclid your best equipment investment.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, O.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



A 22-FOOT LENGTH OF TIDEWATER TUNNEL, under the Southeastern Expressway in Boston, Mass., is poured in freezing weather by a P&H crane. Savin Construction Co., East Hartford, Conn., poured the invert and then erected falsework to support the 14-foot-high wrought-iron plate. After the plates were welded in place, reinforcing rods were set, a 22-foot section of wood form positioned and blocked, and the roof and side walls poured monolithically. Wrought-iron bars supplied by A. M. Byers Co., are welded to the face of the side-wall plates and will be embedded in the concrete.


# REAR-DUMP

## It's new...but JOB PROVED!

ig 18.00 x 25 tires on all wheels permit better distribution of payad. Rugged body and frame are designed to withstand loading, auling and dumping big loads of heavy excavation year in and ear out. Quarry body is available for rock work.

Low loading height and good maneuverability of the R-27 increase the efficiency of loading equipment. Exhaust heated body for work with wet, sticky material is optional. Front and rear springs are thrust-mounted and free floating, with variable spring centers.

The R-27 is equipped with dual steering jacks—one for each wheel —and an independent hydraulic system for steering. Oil retarder—an integral part of the Torqmatic Drive—permits faster safe travel speeds down grade and reduce brake maintenance cost.

Large capacity hydraulic pump and twin hoists have ample power to raise and dump the load fast. Mounting brackets for the two stage double acting hoists are an integral part of frame assembly. Comfortable, well insulated cab is offset for maximum visibility.

**A COMPLETE LINE OF REAR-DUMPS—**

**10, 15, 18, 22, 27, 40 and 50 ton capacities, also semi-trailer models of 12, 22 and 35 ton payload—to fit any job**


### Chemicals and abrasives in winter maintenance

Two bulletins from the Calcium Chloride Institute deal with winter maintenance of highways. "Calcium Chloride in Winter Maintenance" describes the different types of abrasives and how they should be treated and stored. Treated abrasives are one of the most efficient means of providing immediate traction for vehicles traveling on icy or snow-covered pavements.

"How to Use Chemical Mixtures in Winter Maintenance Work" illustrates and describes methods for applying the chemicals, and for mixing and storing them. This bulletin outlines procedures for using mixtures of bulk chemicals as well as mixtures of bag chemicals.

Single copies of each bulletin are available on request from the institute, 909 Ring Bldg., Washington 6, D. C.

### Management requirements in construction industry

"Construction Management and Superintendence", by Walter C. Voss, analyzes the many problems of management requirements in the construction industry. Part I of the book discusses personnel in general, contracts and subcontracts, records and record forms necessary for hiring and firing workers, and purchasing and deliveries.

Also covered in Part I are changes in contracts; cost records in lump-sum, cost-plus, and price-unit contracts; and the procedure of job office control. Part II discusses the details of superintendence to insure adherence to plans and specifications, and the final inspection.

The $5.50 book may be purchased from D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N. J.

### Diesel Construction moves two departments

The engineering and construction departments of Diesel Construction Co., Inc., New York City, are now located at 4 W. 58th St. The departments have more than double the space they had in the former location. The office of the board chairman, as well as administrative and management offices, is still at 24 W. 58th St.

←For more facts, circle No. 241

Winter Work

# Winter clearing starts grading of mountain road

After a heavy fall of snow in the Sierras, a test model of the Euclid C6 tractor clears a pine thicket along the right-of-way for U. S. 40 between Boca and Floriston, Calif. The rig, with Gar Wood winches front and rear and Gar Wood cable controls for its dozer, also has a canopy to protect the operator from falling trees.

Light snows in early winter and mild weather just before spring encouraged a grading and paving joint venture to start clearing and grubbing for U. S. 40 between Boca and Floriston, Calif., two months ahead of the construction season. This early start made it possible for the firms to complete much of the clearing, grubbing, and burning in advance of the fire season, even though heavy spring snows brought work to a temporary halt.

Completion of this early work before dry conditions in the area made fires a hazard was the goal of the firms on this $7,325,011 job, handled by Isbell Construction Co., Reno, Nev.; Granite Construction Co., Watsonville, Calif.; and Gordon H. Ball, Inc., Danville, Calif.

By mid-February, crews were on the site in the Truckee River Canyon on the east slope of the Sierra Nevada range. Here, at an elevation of about a mile above sea level, crews had completed only a minor portion of the preliminary work when severe storms and deep snows hit in March and in early April. This slowed the job, but the heavy moisture content in the snows delayed the drying-out period of the forest for another month, extending the safe burning season beyond the May 1 deadline.

### To interstate standards

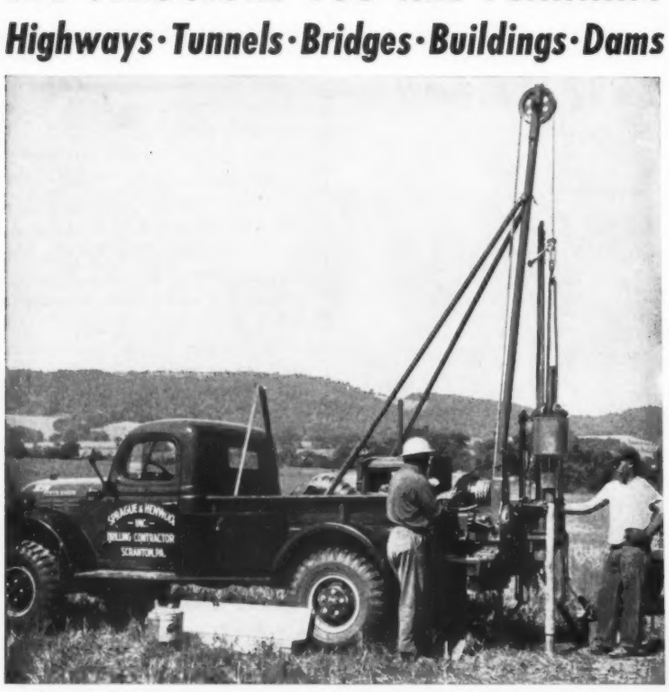
Grading and paving this 6.716 miles of mountain road to interstate standards is a big job planned for two construction seasons, with completion set for next October. This section, together with sections currently under construction on each end of this job, will provide 21 miles of four-lane divided highway from the Nevada state line to Donner Lake.

Included in the contract is the excavation of 2.335 million cubic yards of earth and rock, with 25 million station-yards of overhaul over the 500-foot freehaul. The foot-deep subbase will require the importation of 202,500 tons of aggregate, while the 4-inch cement-treated base calls for 125,000 tons of material. The 8-inch-thick pavement of the two 24-foot-wide roadways will take 40,300 cubic yards of portland-cement concrete; ramps and shoulders will be surfaced with bituminous concrete.

Bridges at five locations provide grade separations with the tracks of the Southern Pacific Railway and


## SUB-SURFACE INVESTIGATIONS FOR THE STRUCTURE YOU ARE PLANNING

***Highways · Tunnels · Bridges · Buildings · Dams***



A Sprague & Henwood Drill Crew Recovering Soil Samples For A Highway Relocation Project

The lasting success of any construction project depends on the design of a proper foundation; and the design, in turn, depends on an adequate knowledge of the sub-surface soil and rock.

Sprague & Henwood's unbeatable team of experienced drill crews, modern equipment, and expert supervision is your assurance that the soil samples and rock cores recovered will be the best obtainable under the conditions that prevail. The structures of tomorrow are only as good as they are designed today, based upon a complete, accurate, and dependable sub-surface study.

Behind Sprague & Henwood's drilling and supervisory personnel is 75 years of accumulated knowledge and experience, gained from completing thousands of successful drilling contracts, under every conceivable condition.

The equipment used is first-quality and of the proper type. It is built in Sprague & Henwood's own plant, and is "field-tested" prior to being put into general use to insure customer satisfaction and completion of the job in the shortest possible time.

Crews and adequate equipment are located throughout the United States. Other services include grout-hole and blast-hole drilling and pressure grouting.

**SPRAGUE & HENWOOD, Inc.**
SCRANTON 2, PA.
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For more facts, use Request Card at page 18 and circle No. 242



## YOU CAN BID LOWER AND MAKE MORE PROFIT with a DOTMAR Curb, Gutter, Sidewalk Paver!

Dotmar Paver with extensions paves integral gutter, curb and sidewalk.

Dotmar with extensions paves state highway median strip.

Dotmar paves gutter on expressway. A truly versatile machine.

Dotmar paves curb and gutter; over 8' per minute. Total job 14 miles long.

Hundreds of contractors are cutting costs and increasing profits with a Dotmar Paver. Pays for itself in first mile of paving. Greater concrete yield. Easy to operate. Trowels for any shape of curb, gutter, sidewalk or highway strip. Send for Catalog 57

*Makers of Dotmar Magnesium Forms, Brush Cutters and Roadside Seed Bedders.*

**Dotmar INDUSTRIES Inc.**

519 HANSELMAN BUILDING KALAMAZOO, MICHIGAN

For more facts, use Request Card at page 18 and circle No. 243

Another Euclid C6, this one with a hydraulic dozer and a Gar-Wood rear-mounted ripper, works on a haul road through the area. Plenty of rock on this job—as well as the snow and cold—made the work difficult.

With snow still in the timber, Isbell Construction Co. starts assembling one of the two big cranes used in the rock cuts. Parts of a Bucyrus-Erie 150-B are delivered on a Fruehauf trailer pulled by a Mack truck.

with intersecting local roads. In addition to the bridges, the job includes some 10,000 linear feet of corrugated-metal-pipe culverts in 12 to 36-inch sizes and 2,500 linear feet of 8 and 12-inch perforated underdrains.

Building a highway to interstate standards through the Truckee Canyon involves some special problems. The relatively narrow valley carries the Southern Pacific railway and the Truckee River in addition to the highway. On a connecting project last summer, the contractor also had to contend with a wooden flume carrying water to a hydroelectric plant. The work on this job delayed traffic up to two hours.

#### Detours built in advance

On the current project, traffic delays should be few, since part of the route is on a new alignment, and a detour has been built in advance around the area where work must be done on the old road. The state built this detour under a separate contract last year to eliminate traffic delays and the high cost of having the contractor handle traffic through the job.

The clearing and grubbing item, bid at a lump-sum price of $540,000, was a big operation in itself. Most of the heavy work was handled by a spread of crawler tractors which included an Allis-Chalmers HD-16, two Euclid C6's, a Cat D6, a D7, a D9 and seven D8's. A variety of front and rear attachments adapted the machines for the specific jobs.

The areas to be cleared ranged from scattered clumps of small brush to dense stands of pine containing some merchantable timber. Workmen used a Homelite 6-22 chain saw with a brushing blade to cut the brush in areas where it was not feasible to use a dozer.

One of the D8's, equipped with a Fleco root rake, gathered up the brush, trimmings, and other combustible materials and stacked them on the right-of-way for burning. In many areas it took a skillful operator to sort burnable material from the stones so that the pile did not end up full of boulders.

On the larger trees, one of the Euclid C6's and one or more D8's pushed over the trees and dozed them out of the ground. This C6 had a Gar Wood cable-controlled dozer and front and rear Gar Wood winches.

*(Continued on next page)*

There's no paint on a Lufkin Chrome Clad Mezurall® tape rule blade. It's all metal.

The bold, black markings are bonded to the basic metal . . . protected with several electroplatings that give extra strength to the blade. The final coat is Lufkin's exclusive Chrome Clad finish. Glare free, smooth, rust resistant . . . the most durable tape rule you can buy.

**Plated steel case** is light, strong, long-lasting. Blades are easily replaceable. Come in 6, 8, 10 and 12-foot lengths . . . either ½" or ¾" width.

THE LUFKIN RULE COMPANY
TAPES • RULES • PRECISION TOOLS
SAGINAW, MICH. • NEW YORK CITY • BARRIE, ONT.

For more facts, use Request Card at page 18 and circle No. 244

Photo courtesy of Pettibone Mulliken Corp., Chicago, Ill.

# MARVEL Synclinal FILTERS

## are Standard Equipment on Pettibone "SPEED SWING" 180 Degree Swing Loaders

SUMP TYPE (Cutaway)

**MR. A. T. LOGUS, Chief Engineer of Pettibone Mulliken Corp. expresses preference for Marvel Synclinal Filters as follows—**

(A) "The ratio of the total filtering net area to the net area of the inlet pipe is much higher than any other oil filter on the market.

(B) The direct result of the high area ratio is lower hydraulic pressure drop over prolonged operating periods.

(C) All materials used in manufacturing the Marvel Filters are impervious to corrosive action from the additives and other elements contained in oil.

I might add that the price of these filters is lower than some makes of oil filters that are much less desirable on the basis of the above three points."

### OVER 800 Original Equipment Manufacturers

of stationary or mobile equipment utilizing hydraulic or other low pressure liquid circulating systems are installing Marvel Synclinal Filters as Standard Equipment.

LINE TYPE (Cutaway)

**A SIZE FOR EVERY NEED**

Available for sump or line installation in capacities from 5 to 100 G.P.M. Greater capacities may be attained by multiple installation (as described in catalog). Choice of monel mesh sizes range from coarse 30 to fine 200.

**EASY TO CLEAN**

Both sump and line types are easily disassembled, thoroughly cleaned and reassembled, on the spot, in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

### IMMEDIATE DELIVERY

*For further information, write, wire, phone or use coupon below.*

Catalogs containing complete data available on request

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7227 N. HAMLIN AVE.,
CHICAGO 45, ILLINOIS
Phone: JUNIPER 8-6023

Without obligation, please send me complete data on Marvel Synclinal Filters, as indicated:

☐ Catalog #108—For Hydraulic Oils, Coolants, Lubricants
☐ Catalog #200—For Fire-resistant Hydraulic Fluids (Aqueous Base)
☐ Catalog #400—For Fire-resistant Hydraulic Fluids (Synthetic)
☐ Catalog #301—For Water

CE-10

Name .....
Company .....
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City .....
State .....

For more facts, use coupon

Pushing rock, dirt, sticks, and snow with its U-dozer, a D8 clears a path for a haul road when snow conditions permit work to resume.

Brush is gathered and stacked for burning by a D8 with a Fleco rake. The operator's biggest problem is sorting out the brush and logs from the rocks.

With engine enclosed to provide extra heat for the operator, a D8 tractor-dozer widens a road to a source of base aggregates.

(*Continued from preceding page*)

The D8's used on this work were also fitted with dozers and winches. All of the tractors used in the clearing operations had heavy canopies to protect the operators from falling trees or limbs.

When the trees had been knocked down, the Allis-Chalmers HD-16 skidded those with merchantable logs to a decking area. Here workmen with Homelite chain saws trimmed the logs and sawed them to length. After the snow was gone, the logs were piled at the roadside where they could be loaded on logging trucks to go to the mill.

### Plenty of rock

Pioneering the cuts, building access and haul roads, and stripping off the rocks and topsoil were assignments for the other tractor-dozers. The second C6 had a hydraulically controlled dozer and a rear-mounted Gar Wood ripper. The D9 and several D8's had Cat dozers and rippers.

These rigs fought their way through a maze of rocks and boulders of all descriptions, which covered much of the ground. The rocks had to be pushed aside or pushed into low areas and covered with the limited amount of dirt which could be scraped up, in order to build roads for the "Eucs" and scrapers which were to follow.

One unit of about 300,000 cubic yards of material had to be moved from a cut across the river to a fill on the opposite side. To cross the river, the contractor erected a Bailey bridge, which rests on discarded old dump bodies at both banks.

### Use big electric shovels

To take out the big rock cuts, the contractor moved in two large electric shovels. The largest, a Bucyrus-Erie 150-B machine, uses a 6-yard bucket. Power for this machine is taken from a commercial power line through a transformer bank. A slightly smaller Bucyrus-Erie 110-B with a 4½-yard dipper operates from a big Cat portable generator.

In addition to the two big shovels, the contractor is using three Northwest 80D's with 2½-yard dippers. A fleet of Euclid end-dumps hauls from

# When there's no time for downtime specify Spicer H-D Clutches

Before you start the job, make sure your trucks, your earthmovers, and other equipment, are all equipped with Spicer Heavy-Duty Clutches. That way, you won't have to stop for repairs when time is at a premium.

Play it safe . . . protect your schedule with these extra-durability features that add months more wear to Spicer H-D Clutches:

**Anti-friction design . . .** Mounting the spring on knife-edge fulcrums reduces friction . . . reduces pedal pressure . . . insures chatter-free operation in both forward and reverse.

**Built-in parallelism . . .** Contact surfaces are permanently and accurately parallel to insure uniform pressure—regardless of wear—and to eliminate the possibility of cocking.

**Easy adjustment . . .** Pressure spring tension can be re-adjusted in the field, by almost anyone, without special tools.

**Ceramic-type facings . . .** For maximum facing life in tough, off-highway service, order your Spicer H-D Clutches with long-wearing, heat-resistant ceramic-type facings.

DANA Spicer

**DANA CORPORATION • Toledo 1, Ohio**

*DANA PRODUCTS Serve Many Fields:*

**AUTOMOTIVE:** Transmissions, Universal Joints, Propeller Shafts, Axles, Powr-Lok Differentials, Torque Converters, Gear Boxes, Power Take-Offs, Power Take-Off Joints, Clutches, Frames, Forgings, Stampings.

**INDUSTRIAL VEHICLES AND EQUIPMENT:** Transmissions, Universal Joints, Propeller Shafts, Axles, Gear Boxes, Clutches, Forgings, Stampings.

**AVIATION:** Universal Joints, Propeller Shafts, Axles, Gears, Forgings, Stampings.

**RAILROAD:** Transmissions, Universal Joints, Propeller Shafts, Generator Drives, Rail Car Drives, Pressed Steel Parts, Traction Motor Drives, Forgings, Stampings.

**AGRICULTURE:** Universal Joints, Propeller Shafts, Axles, Power Take-Offs, Power Take-Off Joints, Clutches, Forgings, Stampings.

**MARINE:** Universal Joints, Propeller Shafts, Gear Boxes, Forgings, Stampings.

*Many of these products manufactured in Canada by Hayes Steel Products Limited, Merritton, Ontario.*

For more facts, use Request Card at page 18 and circle No. 245

After a heavy April snowfall, the survey party and resident engineer's staff had a hard time finding their truck and office at the maintenance yard in Truckee. Snow is up to the windows of the resident engineer's trailer office, rear.

## Land-planning manual in revised edition

The National Association of Home Builders has published a second revised edition of "Home Builders' Manual for Land Development". The 264-page book contains data on site considerations, development factors, utilities for subdivisions, streets and roads in subdivisions, and lot planning for subdivisions. It also discusses shopping centers, problems in community planning, private covenants, and conservation practices in subdivision planning.

The $5 book may be purchased from the association, 1625 L St. N. W., Washington 6, D. C.

the shovels. Experience under similar conditions proved to this contractor that the large shovels can move a lot of material without blasting, whereas less powerful shovels would require drilling and blasting of the rock.

Moving in these machines and assembling them was a major operation in itself. After selecting an assembly site on a high and dry flat spot beside the highway, the contractor began hauling in and assembling the shovels during the winter and early spring months. They were on the job and ready to go as soon as weather conditions permitted in April. The grading is expected to be substantially completed this season, with base and paving to follow next year.

Managing the project for the joint venture is project manager Harry Varischetti of Isbell Construction Co. Superintendent of the grading operations is Ed Dempsey, and superintendent of the structure operations is Al Banducci.

This project and several others in the vicinity are being done under the supervision of District III of the California Division of Highways. The district engineer is Allan S. Hart, and the district construction engineer is D. E. McCollum. The resident engineer on the job is K. C. Jones, and assistant resident engineer is M. M. Mertens. THE END

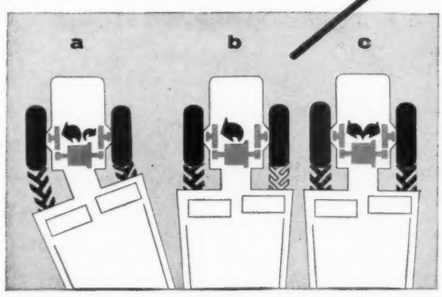
Merchantable timber that has been cut down is sawed into lengths by a Homelite 6-22 chain saw. The logs will be stacked in convenient spots along the roadside and sold to sawmills.

...Obstacle to profit

One condition that seriously slows or stops dirtmoving activities is mud. Flotation and traction in soft, slippery materials has always been a problem for most scrapers and haulers. Even wet clay, loose gravel, and sand can hamper your production and profits — unless you work with the right equipment.

Takes mud in stride

No other earthmover gives you the all-weather traction advantages of LeTourneau-Westinghouse Tournapulls®. Electric pivot steer . . . plus high-flotation tires . . . help pull L-W scraper or Rear-Dump out of soft spots. Exclusive L-W power-transfer differential applies 'Pull's† traction to drive-wheel that can best use it. Result? Steady, profitable production . . . long after other rigs are bogged down!




How it works

Patented L-W differential automatically slows spinning wheel, transfers up to 4 times its power to drive-wheel on firmer footing. As slipping wheel begins to grip, power becomes equalized. Arrows in diagram at left show allocation of tractive effort: (a) when turning; (b) when 1 wheel slips; and (c) in good footing. L-W power-transfer differential is simple, trouble-free . . . never needs maintenance or replacement. It is standard on all Tournapull prime-movers. Ask to see L-W 'Pulls in action.

†Trademark 1906-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOI

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# Dozers double as snowplows on winter grading job

In a cut section, a LeTourneau-Westinghouse Model D, left, is push-loaded by a Tournatractor, while a Model C is given an assist by an Allis-Chalmers HD-20.

Dozers did double duty as snowplows to clear the way for fast-moving scrapers grading U. S. 31 near Holland, Mich.

Up to 3 feet of snow was on the ground during part of the work, and bulldozers were kept busy pushing the snow out of the right-of-way and clearing borrow-pit areas. On some days during February, Carl Goodwin & Sons, the general contractor, had to move as much snow as he did dirt.

Although temperatures dropped well below freezing, frost in the ground was no great problem. The heavy blanket of snow kept the cold out of the earth and, after the snow was removed, the sandy soil was naturally resistant to frost. Scrapers, pushed by dozers, had no trouble in picking up the material.

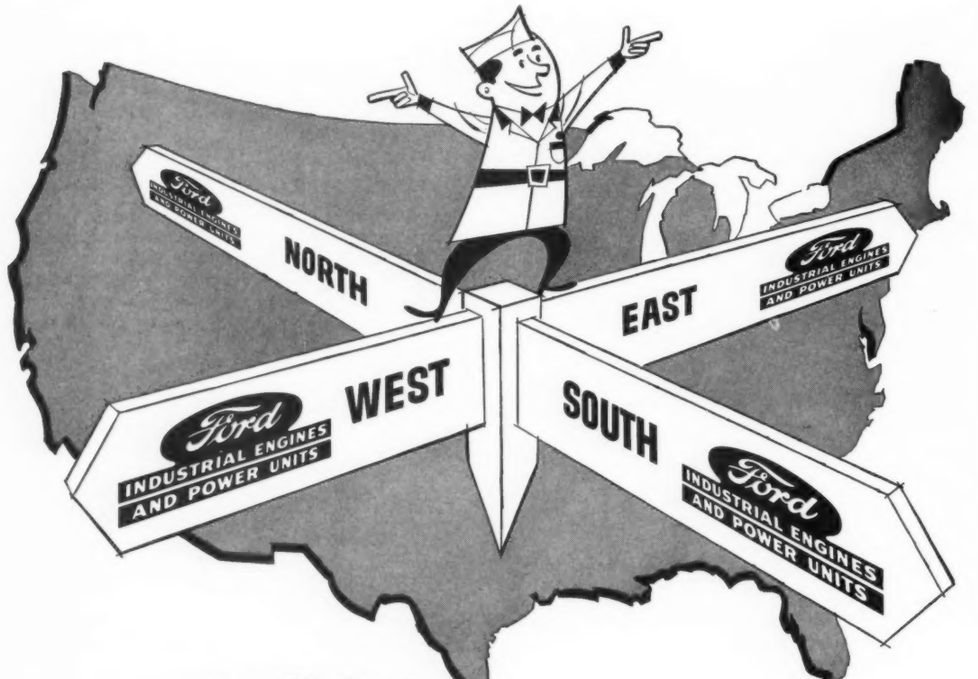
During the cold and snowy Michigan February, Carl Goodwin & Sons, Allegan, Mich., started work on the $959,860 contract for the grading and paving of a 9-mile stretch of 24-foot-wide pavement. The 9-inch uniform reinforced-concrete pavement provides an additional two lanes for southbound traffic on U. S. 31 from West Olive to Holland. The original 2-lane highway, built in 1950, carries northbound traffic. In addition to drainage structures, the contract also called for the building of a single-span bridge across the Pigeon River.

Working through a Michigan winter is not unusual for Carl Goodwin & Sons. The firm generally keeps its grading outfit busy, for in the area bordering Lake Michigan, the soil is sandy and winter work is feasible. During the winter, equipment in need of repair or overhaul is serviced at the Allegan yard. Using insulated forms and heated concrete, the bridge crew also keeps working through the cold season.

### Snow problem

Snow removal was the big problem on this contract, for both the grade and the borrow pit had to be kept clear. A tractor-dozer was kept busy most of the time clearing 2 to 3 feet of the white stuff ahead of the scrapers. Sometimes, even the big Euclid TS-24 scrapers pitched in to grab a few loads of snow.

In cold weather, the earthmovers were directed to build up a relatively short distance of fill. A thicker blanket of material was placed during the cold days so that less surface

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To meet *your* requirements, Ford offers a full line of 4-, 6- and V-8 cylinder gasoline engines and power units ranging in displacement from 134 to 534 cubic inches. Most are available as engine assemblies or complete power units, foot- or skid-mounted.

Also, there are now two Ford Diesels available—the Ford 220- and the new Ford 330-cubic inch Diesel. Write to us for the name of the Ford Industrial Power Headquarters nearest you.

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INDUSTRIAL ENGINE DEPARTMENT

FORD Division of FORD MOTOR COMPANY, P. O. BOX 598, DEARBORN, MICHIGAN

For more facts, use Request Card at page 18 and circle No. 247

Before earthmovers come along, this Cat D9 tractor-dozer clears 2 to 3 feet of snow from the road alignment so that topsoil can be stripped. The snow was actually helpful, for it kept the ground warm.

With the snow cleared, a LeTourneau-Westinghouse Tournatractor dozes topsoil off to one side. The rig's tires are filled with a solution of calcium chloride to add 1,700 pounds of weight per tire to the dozer.

A Euclid TS-24 twin-engine scraper, one of 12 earthmovers on the job, dumps on a fill area. The sandy material, which resists the frost, made this grading job feasible during the height of the winter season.

area would be exposed to the frost at night. The next morning, the frost that did penetrate the fill was soon broken up by the wheels of earthmoving equipment.

The scrapers and dozers were all equipped with enclosed cabs to protect the operators from the weather. Although the job never shut down because of the cold, blizzard conditions made it impossible to work during one week in February.

**Equipment on this job**

Two Euclid TS-24 scrapers
Seven Model C Tournapulls
Three Model D Tournapulls
Two Allis-Chalmers HD-20 tractors
One Cat D9 tractor
Two Tournatractor dozers
An Allis-Chalmers HD-15 with dozer
A Galion motor grader
A Cat No. 12 motor grader
Lamar Pipe & Tile Division of American Marietta Co. supplied reinforced-concrete culvert pipe
A Northwest Model 6 1½-yard crane
An Insley ½-yard crawler
A Little Bertha torch
A Jackson vibrating compactor

**Work area restricted**

Aside from the winter weather, lack of room sometimes hampered the grading equipment. The grade was bordered close on one side by the existing highway and on the other side by a drainage ditch and a railroad. In fact, there wasn't even enough room for scrapers to stockpile topsoil off to one side of the roadway; instead, the topsoil was dozed into a windrow at the edge of the road.

Seven borrow pits strung along the length of the job supplied about 80 per cent of the 265,000 yards of dirt on the contract. The terrain along the grade was generally flat, and the borrow was used to build the road up 3 to 4 feet.

Charging from borrow pit to fill was a squadron of 12 scrapers. Nine of the rigs carried the bulk of the dirt, while the three smaller units were put on short hauls and cleanup work. The scrapers were generally push-loaded by three tractors.

Occasionally, one of the rubber-tire tractors on the job push-loaded

(*Continued on next page*)


## How more gear-ratios, more speeds, save work-time . . . reduce your grading costs

An L-W Adams† model grader can save you *hours* of work-time daily. You'll find you have spare time in which to move *extra* hundreds of yards of dirt . . . complete *extra* miles of blade work. Compared to ordinary graders, all LeTourneau-Westinghouse 80 to 160-hp Adams model graders give you more gear-ratios in the regular work-range . . . higher speeds in the top gears . . . both forward and reverse.

You get extra leveling, ditching, spreading, and haul-road blading done each day, with the added power-speed combinations found only in L-W graders. Their 15 full-power gears (8 forward, 4 reverse, 3 optional creepers) let you work, maneuver, and travel . . . always at or near full engine-power. Your grader gets to the job quicker, does the work faster . . . moves-on to handle new assignments that other graders would have to put-off until the next day.

Other graders just don't have enough gear-ratios. To do the same jobs that an L-W can handle at full-throttle speeds, other graders must shift-down to a lower-speed gear. Or, they'd have to shift to a too-high gear, throttle-down, and take a smaller "bite."

The chart shows examples of time-savings you can realize *in one 8-hr day,* with a 115-hp L-W Adams Model 440 as compared to other 115-hp graders. In all sizes, you'll find L-W graders give you similar advantage.

For lower grading cost — for a bonus profit — check the man and machine-hour savings you can realize with L-W graders. 7 models—60 to 190 hp*. Your choice of GM or Cummins engines on 6 larger models. Call or write for full information, and a demonstration.

**135 and 190-hp* POWER-*Flow® graders provide infinite number of power-speed combinations thru torque converter. 60-hp L-W Model 220 has 9 speeds forward, including optional creeper gears, plus reverse.*

**EXTRA WORK-TIME SAVED DAILY**

| | |
|---|---|
| **Spreading fill** — L-W 440 blades at full power in 3rd gear at 4.6 mph. Most competitive graders — also 115 hp — must take a lighter cut, or work at around 3.6 mph. In 8 hours . . . YOU CAN SAVE . . . | 1 hr 44 min |
| **Bank sloping** — 115-hp L-W cuts at full power in 2nd gear, at 3.2 mph. Most other 115-hp graders must shift down to 1st gear, and handle cut at around 2.3 mph. In 8 hours . . . YOU CAN SAVE . . . . . | 2 hr 30 min |
| **Maintaining haul roads** — L-W 440 smooths roads at full power . . . about 6.5 mph in 4th gear. Other makes of 115-hp graders take less cut, or must work at around 5.5 mph. In 8 hours . . . YOU CAN SAVE . . . . . | 1 hr 13 min |
| **Shuttle-grading** — On one-way work, "440" backs-up in 4th gear, at around 13.2 mph—while most competitive 115-hp graders back-up to beginning of cut at about 6.3 mph. On the back-ups alone, in 8 hours (with average forward push at 4.5 mph) . . . YOU CAN SAVE . . . | 1 hr 42 min |
| **Travel** — 25.2-mph "440" makes a 30-mile trip in 72 minutes, while most other 115-hp graders take around 94 minutes. On every 2½-mile move from one work assignment to the next, the L-W Adams model grader saves about 1.8 minutes. On just 5 short moves during the work day . . . YOU CAN SAVE . . . . . | 9 minutes |

†Trademark G-1819-DC-1

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Installation of drainage structures, included in the contract, was also done during the winter months. At left, the 48-inch reinforced-concrete pipe is being backfilled by an Insley ½-yard crane with Hendrix 22-cubic-foot bucket. Above, compaction is handled by a Jackson vibrating compactor that is powered by a portable generator.

*(Continued from preceding page)*

some of the scrapers. Although the rubber-tire units got the job done, they found it difficult to gain traction in the sandy material. These rigs were generally used to spread the fill, assisted by a crawler tractor with dozer. Compaction equipment was not required, since the necessary density of 95 per cent was achieved by the equipment operating on the fill. Two motor graders maintained the haul roads from the borrow pits to the fill so that scrapers were able to hit good speeds on their runs.

After the grade was built, the road received a 3-inch layer of processed gravel and a 9-inch pavement of reinforced concrete. The 9-mile stretch is scheduled to be completed next month.

### Pipe crews work through winter

Pipe crews also worked through the cold weather to place the greater part of 4,900 feet of 12 to 72-inch reinforced-concrete pipe used to extend the existing culverts under the new road.

To excavate the shallow trenches and place the pipe, the contractor used a ½-yard crawler and a 1½-yard crane. Since the water table was high, ground water was drained to a sump at the low end of a culvert and pumped out of the trench.

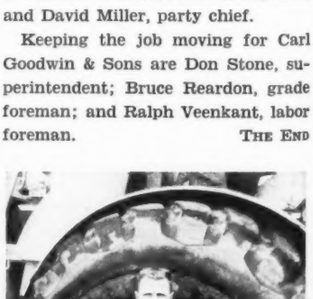
Since mortar joints were made in cold weather, sand and water were heated in a portable heating unit consisting of a torch fired by bottled gas. The torch put out 175,000 Btu's per hour to heat small quantities of sand and water. After the mortar was placed, the joint was covered with a layer of sand to keep it from freezing.

The backfill, placed in 9-inch lifts, was compacted to 95 per cent density by a vibrating compactor that was moved easily from culvert to culvert on a rubber-tire trailer. The trailer also contained the generating unit.

### Personnel

Supervising the construction for the Michigan Highway Department are Harold T. Rice, resident engineer, and David Miller, party chief.

Keeping the job moving for Carl Goodwin & Sons are Don Stone, superintendent; Bruce Reardon, grade foreman; and Ralph Veenkant, labor foreman. THE END



A couple of big wheels on the job are Don Stone, superintendent for the general contractor, and one belonging to a Euclid TS-24.

MONOTUBE PILE DATA
PROJECT—Improvement and reconstruction of piers in Manila Harbor
TYPE PILE—FN
TIP DIAMETER—8 inches
BUTT DIAMETER—18 inches
GAUGE—#3
UNSUPPORTED LENGTH—40-50 feet
DESIGN LOAD—50-60 tons
OWNER—Republic of the Philippines
DESIGN—Division of Ports and Harbours, Bureau of Public Works
CONTRACTOR—Atlantic, Gulf and Pacific Company, Manila, P.I.
Monotube piles were supplied for this project through a joint venture of the International Cooperation Administration and the National Economic Council under the ICA aid program.

***EASY HANDLING*** with Monotube piles. The strength, rigidity and light weight of the fluted steel Monotube permits a simple one point pick up of this 140-foot pile. The pile being quickly and easily positioned for driving is one of 4310 piles manufactured by Union Metal for use in the improvement and reconstruction of piers in Manila Harbor.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

**UNION METAL**

*Monotube Foundation Piles*

For more facts, use Request Card at page 18 and circle No. 249

Rigs work all year round on various jobs for F&S Contracting Co., Butte, Mont. On this project, F&S' Michigan Model 175A tractor shovel pulls free a 20-yard loaded truck that was bogged down in sand.

## Contractor's machines earn profit all year

The year-round operations of F&S Contracting Co., Butte, Mont., keep all machines constantly on the move, particularly its tractor shovels which are doing much more work than they were bought to do. Originally, F&S' two Michigan Model 175A 2¾-yard machines were put to loading out haul trucks in the firm's sand pit. But one machine proved to be sufficient for this work, and the second tractor shovel was assigned to loading rail cars at the company's fluorspar mine.

Today, when not in the pit or mine, the Michigans feed sand to F&S' dryer and screening plant, and stone to the hot-mix plant. They also work for another firm to clean up spillage around a crusher.

## Texas roadbuilders form affiliate of the ARBA

The Texas Road Builders' Association has been formed as an affiliate of the American Road Builders' Association. The ARBA's Contractors Division approved the Texas organization's application for an ARBA state charter. In an arrangement with the Texas Highway-Heavy Branch of the Associated General Contractors of America, it was agreed that the manager of that branch, James M. Richards, will serve as executive secretary of the TRBA.

Officers of the Texas branch of the AGC will serve as officers of the ARBA affiliate. E. B. Cape is president and L. P. Gilvin, vice president. The TRBA headquarters are in Austin.

## Consulting engineer expands, reorganizes

The Dallas, Texas, consulting engineering firm of Koch & Fowler has been reorganized as Koch & Fowler and Grafe, Inc. Adam K. Grafe is president; and Earle W. Sudderth and James D. Fowler, co-founder of the 44-year-old firm, are vice presidents.

The reorganized company will institute an extended program of projects for the construction of water systems, sewer systems, and highways and streets for state, county, municipal governments, and private developers.

## New York City firms begin Iran development project

A program of modernization and economic development for a 50,000-square-mile area of the Kerman Province in south central Iran has been started by the Kerman Development Corp. of New York, which is a joint venture of Electric Bond & Share Co. and Allen & Co., New York City investment bankers.

The program for the area, which is comparable in size to New York State, will cover exhaustive studies of the region's resources and potentials, with an eye to expanding its economy through improved and modernized facilities and the development of industry, commerce, and agriculture. Under terms of an agreement between Iran's Plan Organization and the Kerman Development Corp., technical and management skills for the project will be provided by Ebasco Services Inc., New York City engineering consulting firm.

# TIPS ON LOADING

### rubber-tired self-propelled scrapers

More dirt per load, more loads per hour — that's what you want. Careful planning and skillful handling of the loading part of the earthmoving cycle can increase your production, cut operating and maintenance costs, reduce job-time, and effect savings on hauling and spreading.

### Plan the cycle

Even before you bid the job, plan the cycle for your dirtmoving equipment. Make it short, and with as few turns as possible. Load downhill and toward the fill wherever you can. Work a figure-8 cycle-pattern if you have a fill-cut-fill or cut-fill-cut situation. Where you have a series of short cuts and fills, plan a straight-line — cut, fill, cut, fill.

### Pusher loading

With few exceptions, push-loading with a crawler or faster rubber-tired tractor is the most efficient loading method. Determine the approximate number of scrapers one pusher can handle by dividing the scraper cycle-time by the pusher cycle. For instance, a 10-minute scraper cycle divided by a 2-minute pusher cycle gives you a ratio of 5 scrapers to 1 pusher. If you have an 11-minute scraper cycle and the same 2-minute loading, it will prove more profitable to have idle pusher time than to have scrapers waiting to be loaded. Cut scraper waiting time by scheduling scrapers to enter cut at 1½ to 2-minute intervals, based on a 2-minute pusher time.

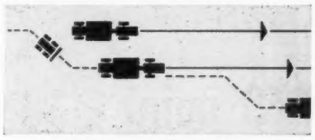
A good working target for average dirt loading is a well heaped load in 1 minute, in 100 feet of travel. An extra-long loading cycle to pack in maximum yardage of dirt is justified only if extra yardage and long haul make it pay off. Use your best tractor and most skillful operator for pusher loading. Consider teaming two scrapers equipped with push-plates, to push-load each other on smaller jobs.

### Downhill loading

To get larger loads in less time, load downhill wherever practical. This gives you 100 pounds added drawbar pull per gross ton of weight for each 5% of favorable grade. Loading toward the fill speeds up the cycle by shortening haul and eliminating turns . . . saves wear-and-tear on equipment.

### Straddle loading

This short-cut leaves a ridge approximately 5′ wide between successive loads. Third pass and every other load thereafter straddles the ridge and gets load with less resistance.



### Chain push-loading

In long cuts, you can save loading time by pulling empty scraper alongside unit being loaded. Pusher then need only swing-over to load the parallel scraper. In level cuts, where you can haul both ways, load alternately in both directions. Position empty scrapers for short 180° pusher-turn from loaded scraper into empty scraper's push-block.

### Maintaining slope

On a side-hill cut, turn prime-mover uphill — at right-angle to cut. Then, turn prime-mover sharply to head parallel to slope. Drop the blade and start digging before the scraper has completed the turn and while it is at right-angle to slope. This cuts a low spot, levels scraper against the up-slope side, holds cut deep into the bank. Cut successive loads so as to work side hill down to grade in steps.

### Loading clay or loam

Loam and most clays cut easily and load well. Very hard clays should be broken by Rooter or scarifier. Don't break material too small. Don't pack wet or sticky material too tight in bowl. Extra time loading and unloading offsets extra pay dirt and you get a lumpy spread.

### Loading sand

Material that tends to run ahead of the blade and apron is best loaded by "pumping". Go into loading area fast, lower blade slowly, using momentum to fill rear of bowl. With pusher behind, "pump" bowl up-and-down so that blade goes down when scraper wheels drop into pockets from previous "pumps". To top out load, lift your blade to increase speed, then drop the bowl sharply and repeat two or three times.

### Loading stone and shale

Some softer rock and shales can be loaded without preparation, but rooting usually makes the job easier and saves more than it costs. If possible, load by starting blade in dirt, then catch scraper blade under a ledge of the layered rock. Pick up loose rock or shale on level or slight upgrades to prevent material running ahead of the blade. Larger pieces of rock (and stumps) can be scooped-up by jacknifing the unit around the rock and pulling the scraper blade under it. Unloading takes a high-lift apron and cautious handling.

### Loading scarified material

Begin loading toward forward end of scarified area, and finish out load against resistance of solid ground to get maximum pay load. Step back in scarified area with successive cuts.

If you want extra copies of this article, write us mentioning this publication. Please state quantity desired.

Rooter—Trademark Reg. U.S. Pat. Off.

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A new concept in

# Cold-weather military housing

by **WILLIAM J. HALLAHAN, senior engineer, Fay, Spofford & Thorndike, Inc.**

Barracks are barracks, soldiers may say, but the multistory, 700-man dormitory constructed for the U. S. Air Force at Goose Bay, Labrador, bears little resemblance to the buildings that soldiers usually associate with military quarters.

Part of a complex that includes a mess hall, kitchen, lounges, and administrative offices, the new 6-story dormitory has a structural concrete frame, concrete floors, and a colored aluminum exterior in the tradition of the newest metropolitan skyscrapers. A self-supporting cellular-glass insulating membrane provides climate-controlled interiors through winter months in a region where temperatures often reach 40 degrees below zero. Extreme climate played a role in influencing the basic configuration, the specific design and engineering features, and the materials selected for the job.

### Design for long winters

Goose Air Base, a civilian-military airport operated jointly by Canada and the United States, is an alternate landing field for transatlantic civilian aircraft when Gander is weathered in, and a stopover for air traffic to military outposts in northern Canada and Greenland. The monotony factor had to be considered in housing design for the base, for men have to live in close proximity with one another during the long and cold winters. And since snowfall is heavy, it was desirable to have all facilities for living and for military administration in one structure, or in adjacent, interconnected buildings.

### Design evolves

These requirements led to the development of the initial dormitory complex for Alaska soon after World War II. These barracks contained, under a single roof, sleeping quarters for 500 men, dining facilities, day rooms, orderly rooms, administration offices, and a downstairs rifle range. But these were bulky buildings, requiring large, open-type squad rooms to provide an outside exposure for all personnel, and a great deal of snow could accumulate against them.

The Department of the Air Force departed from the basic Alaskan design in planning a later installation for Goose Bay Air Base, and used modified standard plans calling for multiple dormitory units, each with individual sleeping quarters and with a nominal occupancy of three men per room. These two-story dormitories are long and narrow, and are normally sited with their major axes parallel to the prevailing wind. Dormitory units are connected by underground pedestrian tunnels to a single-story building that houses mess hall, kitchen, administrative offices, and heating plant for the entire group. All service lines, except sewage, run through these underground tunnels, which protect them from extreme weather. Since they are underground, they do not create wind breaks where snow can pile up, and they do not handicap snow-removal or fire-fighting forces.

But even these airmen's dormitory-type buildings have undergone some changes since 1951. By 1952, the group of ten buildings had been reduced to six larger ones which accommodated the same number of men and were still grouped around a central mess and administration building. By 1955, alternative designs were available for either a two-story build-

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For more facts, use coupon, or Request Card at page 18 and circle No. 251

Work nears completion on the structural concrete frame of the new airmen's complex at Goose Bay, Labrador. The 6-story structure, designed specifically for military bases in cold climates, is going up at a saving of about 10 per cent over the older type of dormitory buildings of the came capacity.

ing for 133 men or a three-story building for 200 men. The administration area had been dropped from the mess building, but the general layout was the same.

While this design may be economically efficient in temperate climates, it is not the best arrangement where winter weather may make it impossible to walk safely outdoors for days at a time. With this problem in mind, the Department of the Air Force, working with the North Atlantic Division and the Eastern Ocean District of the U. S. Army Corps of Engineers, started studies in 1956 to develop an improved type of dormitory complex that would provide living facilities for 700 men. Detailed studies by Fay, Spofford & Thorndike, Inc., consulting engineers of Boston, in cooperation with Harold C. Knight, AIA associate, resulted in a design for a six-story structure with elevators. Merritt, Chapman & Scott, New York, N. Y., and Johnson, Drake & Piper, Inc., Minneapolis, Minn., handled the job as a joint venture known as Drake-Merritt.

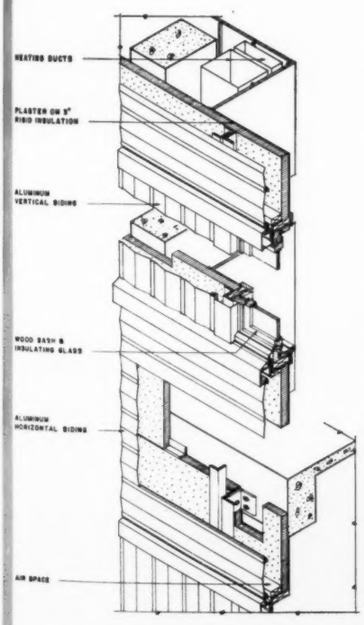
### Cost savings high

Savings in the cost of foundations and roofs alone were estimated to more than offset the cost of elevators. In addition, the single building means fewer exits, stairwells, and toilets; reduces outside utility costs; minimizes the heating losses; and results in savings on plumbing. The accumulated saving over the cost of a series of single two-story structures of the same capacity, and with interconnecting utilidor, is 10 per cent.

The new six-story dormitory complex consists of a fireproof building with a reinforced-concrete structural framework and extruded aluminum exterior walls. Insulated concrete-block walls, commonly used in buildings at Goose Air Base, were ruled out because it would not be possible to erect and close in the building in a single season with this type of construction.

The building has a separate entrance and lounge that is canted with respect to the main dormitory section. The main lobby, which will contain an office counter and telephones, leads directly to the elevator lobby on one side and the lounge on the other.

The main dormitory measures 337 × 43 feet. The first floor contains 42 sleeping rooms, two lavatories, and a storage room. There are two additional sleeping rooms on the second, fourth, and sixth floors; the third and fifth, with 41 bedrooms, each have a small lounge. In all, 700 men are accommodated in the 256 rooms, all of which are laid out for 3-man occupancy.




A cutaway sketch of wall construction shows the combination of the 3-inch-thick cellular-glass insulation and the extruded panel exterior. The insulation is not attached to the exterior skin, but is supported laterally at floors and columns. This provides a ventilated air space between insulation and panels.

For more facts, circle No. 253→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(*Continued from preceding page*)

Each room has a large double-glazed window, patterned after those found in Norway, with wooden frames and sash and an interrupted air space at the joints between these parts to provide a "swirl" area to stop cold-air penetration. Each room also has its zone-type automatic temperature control and is supplied with three air changes per hour by a ventilating system. A separate system is used to heat and ventilate the lounge.

### Insulation encloses frame

The cellular glass used for the wall insulation is 3 inches thick and extends from the foundation walls to the roof, interrupted only by door and window openings. It provides a thermal barrier against temperatures as low as minus 40 degrees F, as well as a free-standing base for interior plaster; supporting lath is not needed. Insulating material is not attached to the exterior metal skin, but is supported laterally at the floors and at the columns. The holes in the insulation, to accommodate the hardware used to attach the metal skin, are sealed. In effect, the cellular-glass insulation encloses the entire structural frame and, at the same time, provides a ventilated air space between itself and the outer metal skin.

### Aluminum panels

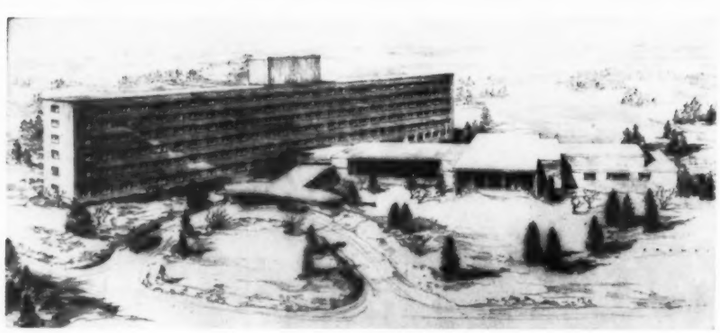
The exterior skin of the building consists of extruded aluminum panels that have a number of advantages for military construction. They are lightweight, nest easily for shipment, are erected fast, and have a permanent weatherproof facing that requires little or no maintenance.

Panel sections anodized a light gray run horizontally across the building; panels anodized Air Force blue run vertically between the windows and on the ends of the building. This is designed to improve the appearance of the building and reduce reflection.

The 4-foot 8-inch × 24-foot spandrel panels are actually built up of multiple 8-inch-wide extruded sections with interlocking joints. These sections can be economically shipped and handled, and are readily assembled into panels in the field. Spanner strips are simply fastened across the back to hold the extruded sections securely in place. When assembled, each panel weighs approximately 200 pounds.

An important feature is that the panels can be erected without staging from inside the building. This not only speeded the work, but also permitted workers to remain within shelter as they erected the sections.

The Goose Bay complex becomes not only the latest concept for north country housing, but for military housing in general. It gives enlisted personnel off-hour privacy that aids high morale. It provides essential facilities for sleeping, eating, administration, and recreation. Yet it minimizes the individual's exposure to a cold climate that makes outside activity almost impossible during winter months. THE END



This sketch of the airmen's complex shows the 6-story dormitory, with anodized aluminum panels covering the concrete frame. It is directly connected to a lounge and the main entrance, center, and to the dining hall and kitchen, right.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Here's the original low-cost motor grader with big-grader design and performance advantages. The Model D handles so many jobs so well, you have to see it at work to convince yourself. Your Allis-Chalmers dealer can arrange a demonstration. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

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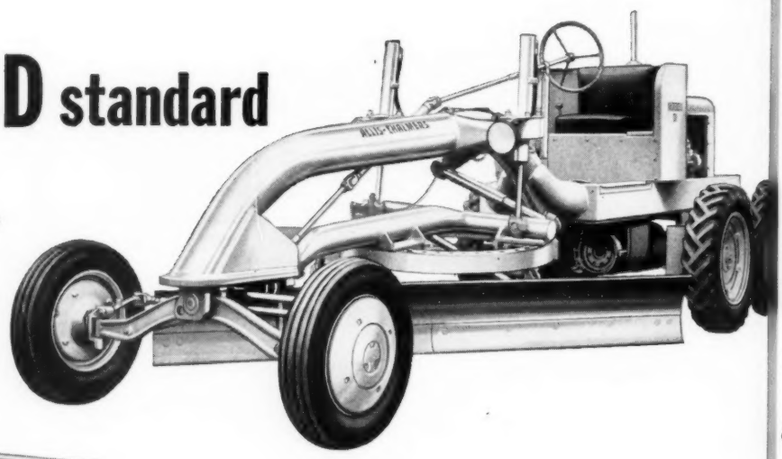

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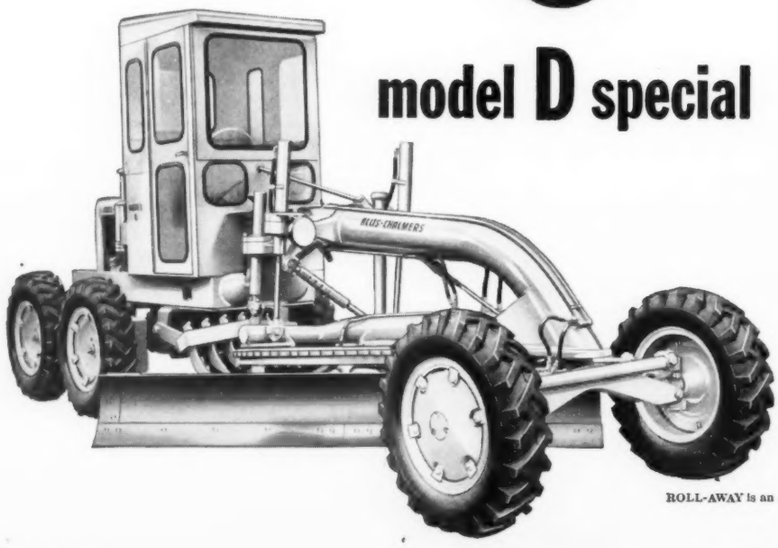

50 hp
Approx. weight
10,900 lb (gasoline)
Approx. weight
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4 forward speeds to 25 mph (approx.)
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All-steel cab*
Shiftable moldboard*
Hydraulic scarifier*
Leaning front wheels*
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*Also available with the model D standard as optional equipment.

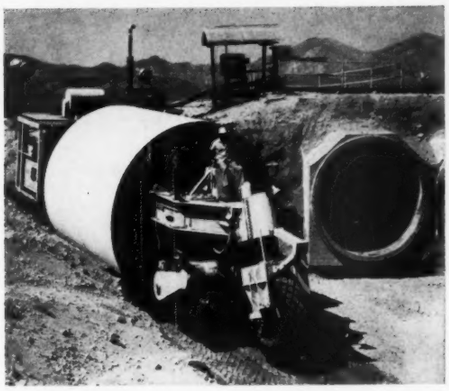
ROLL-AWAY is an Allis-Chalmers trademark.

## Highway safety contest sponsored by General Tire

College scholarships will be awarded by The General Tire & Rubber Co. to the 20 boys or girls who give the best answers to what can be done to assure greater highway safety in the United States. The company, which sponsors the contest, will give a scholarship of $1,000 for the first prize; $900 for second; and $850 for third. Fourth to fourteenth prizes range from $800 to $300 scholarships in a descending scale. The remaining six prizes amount to $200 each.

Each candidate must write, in 250 words or less, what he thinks could be done to assure greater highway safety. Originality and practicality of ideas will be the basis for judging the answers. Any boy or girl attending high school or an accredited college anywhere in the United States, except children of the firm's employees, its dealers, or agencies, is eligible to enter the contest.

Entries will be accepted up to December 1, 1958, and should be addressed to College Scholarship Contest, The General Tire & Rubber Co., 1708 Englewood Ave., Akron 9, Ohio. No one will be declared a winner without the approval of his school faculty.



The Pipemobile, an 80-ton machine, places a 68-ton concrete-pipe section in the Los Angeles-San Diego Metropolitan Water Aqueduct. Riding on seven Goodyear earthmover tires, the machine lifts, hauls, and sets the pipe in one operation. American Pipe & Construction Co., South Gate, Calif., invented the rig.

## Newly invented machine lifts, hauls, sets pipe in one operation

A new machine, called the Pipemobile, lifts, hauls, and sets 68-ton concrete-pipe sections in one operation. Invented by the American Pipe & Construction Co., South Gate, Calif., the unit, on seven 21.00 × 25 Goodyear earthmover tires, crawls part way through a section until the front end is in the clear. The rear part of the rig then picks up the pipe, moves it into position, and jockeys it into place.

Weighing 150 tons loaded, the Pipemobile is being used to build the second barrel of 47 inverted siphons on the Metropolitan Water Aqueduct, a billion-gallon-per-day supply artery which will bring Colorado River water to Los Angeles and San Diego. The machine places an average of 15 joints per day.

Each wheel of the diesel-powered Pipemobile has its own dc electric-drive motor. Four wheels are at the rear of the machine, two at the front, and a single wheel, mounted forward at the end of the heavy-duty hydraulic cylinder, carries the load when the other two front wheels are elevated for the machine to pass inside the pipe.

Hydraulic controls permit the pipe to be maneuvered up, down, sideways, and horizontally. A hydraulic lock at the front end of the carrying frame prevents the heavy pipe from slipping on steep slopes. Internal expanding-retracting rams, against the pipe, act as stiffeners. A heavy-duty winch, mounted in the middle, enables the machine to operate on slopes as steep as 62 degrees.

## Goodyear builds new maintenance facility

A new maintenance garage and fire station of steel-frame and concrete-block construction, with brick veneer facing, is being built by The Goodyear Tire & Rubber Co. at the home plant in Akron, Ohio. The 100×240-foot structure will have an area of 8,400 square feet devoted to the maintenance garage, which will service all outside and inside transportation vehicles, and 4,000 square feet allocated for the fire station.


and construction work

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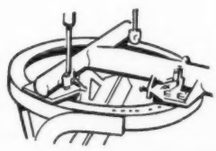
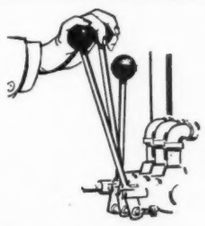
many production-boosting advantages

The ROLL-AWAY moldboard rolls dirt up and ahead to eliminate packing, reducing friction . . . gives you more performance per horsepower, more production per gallon of fuel.



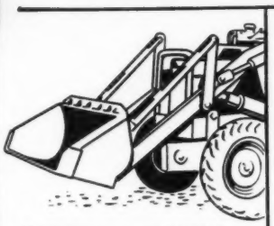
Revolving circle and heavy tubular drawbar provide exceptionally stable moldboard mounting.



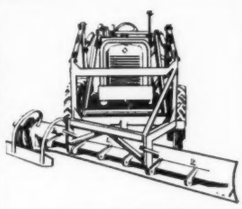
Convenient hydraulic controls, easy to operate. Two levers fit into one hand to control circle lift.

Positive tandem drive gives you four driving wheels under the heavy end of the grader.

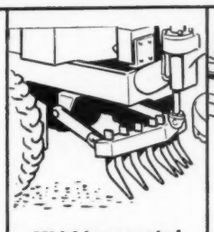
many job-multiplying attachments



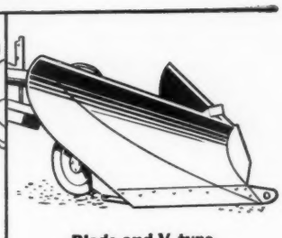
⅝-yd rear-mounted loader



Interchangeable shoulder maintainer



Midship-mounted scarifier



Blade and V-type snowplows

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Look ahead... *move ahead*...and stay ahead

with ALLIS-CHALMERS

For more facts, use Request Card at page 18 and circle No. 254

For more facts on Gulf spread on Insert, use coupon or circle No. 257→

AN ICE-FREE WORK AREA IN SUBZERO TEMPERATURES permitted pier construction on the Vernon Lake Narrows bridge at Huntsville, Ontario, Canada, to continue through the winter. Drevo of Canada Ltd., Toronto, the contractor, laid a plastic pipe, with small holes, across the floor of the channel. Compressed air, passed through the pipe, forced the warmer, denser water at the bottom of the channel to the surface and prevented ice from forming.

This combination of T-700 GRADE-O-MATIC Grader with Snow Plow and Wing has the weight, size, and power to buck the high drifts and make fast headway on any snow removal job.

| | |
|---|---|
| Total weight, approx. (includes Grader, Plow, Wing and lifting mechanism) | 49,670 lbs. |
| Horsepower | 190 |
| Width of "V" Plow (top rear) | 13′ |
| Width of "V" Plow (blade, front) | 10′7″ |
| Height of "V" Plow (at rear) | 7′5″ |
| Width of Snow Wing | 12′ |

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MOTOR GRADERS & ROLLERS

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## Steel corrosion discussed in new HRB bulletin

"Corrosion of Reinforcing Steel and Repair of Concrete in a Marine Environment", Highway Research Board Bulletin 182, comprises two parts of a paper entitled "Causes and Repair of Deterioration to a California Bridge Due to Corrosion of Reinforcing Steel in a Marine Environment", as presented at the thirty-sixth annual meeting of the HRB.

Part 1 discusses the history, character, and extent of deterioration in the San Mateo-Hayward Bridge; the inspection and estimating procedures prior to repair; repair procedures; the basis of contract payment; and the cost of repairs. The second part contains data on the fundamental factors causing corrosion of the reinforcing steel in the bridge, and points out that the spalling and rupture of the various members are primarily the result of pressures caused by the corrosion products.

The 80-cent bulletin may be purchased from the HRB, 2101 Constitution Ave., Washington 25, D. C.

## NLA fellowship fosters lime-stabilization study

The National Lime Association has established a 3-year research fellowship to encourage the study of lime in clay mineralogy at the University of Illinois. The fellowship, which began last month, involves a fundamental study of the reaction of hydrated lime with selected pure clays and clay-type soils.

The key objective is to determine the mechanism behind lime's altering of soil properties. Another goal is the classification of soils according to their potential reaction with lime. James L. Eades, research soils engineer on leave from the Virginia Department of Highways, is the recipient of the fellowship. He is working under the direction of Dr. Ralph E. Grim, professor in the university's geology department and an authority on clay mineralogy.

*A total of 1,952 miles of road, costing $506 million, was completed during the first two years of work on the Interstate System.*

THE WINTER ASSIGNMENT for this Oliver OC-18 crawler tractor, owned by the Auburn Stone Co., Summit, Pa., is to remove overburden, build roads, level stockpiles, and clean pits in the firm's sandstone quarry. Enough trees, dirt, and rock were removed in 12 weeks to open a new pit which will produce for the next five years.

## Highway conference data contained in bulletin

"Proceedings of the Nineteenth Annual Highway Engineering Conference", which was held in early March of this year, are contained in Bulletin No. 88 of the Utah Engineering Experiment Station, University of Utah, Salt Lake City 12, Utah.

Topics discussed include the progress of the Interstate Highway System in the intermountain West; safety traffic needs; planning a state park system for Utah; traffic engineering; opportunities and responsibilities of cities in connection with the Interstate Highway Program; and urban highway planning. Other subjects included are highway design through electronic computation; the national asphalt industry; Utah's highway program; prestressed concrete in highway structures; the contractor's approach to the highway program; the need for quality construction on the Interstate System; and contractor performance in the Road Program.

The bulletin is available without charge.

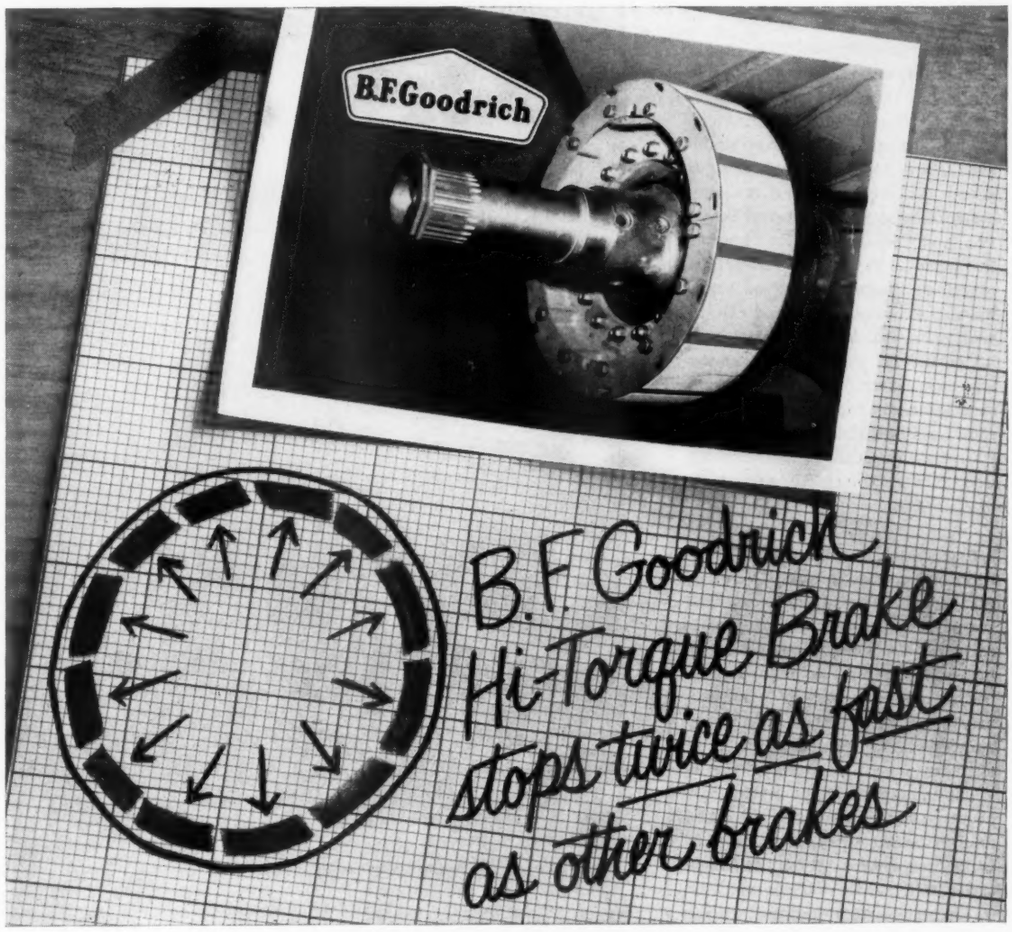
## AED acts to solve parts, service problems

Closer cooperation between distributors and manufacturers of heavy-construction machinery to solve parts and service problems is being sought by the Associated Equipment Distributors.

At a recent meeting, the AED's Parts and Service Committee initiated action to establish a joint-committee relationship with manufacturers, so that such problems could be worked out. The ultimate result will be to increase the services provided to users of construction machinery by distributor members of AED.

## Terry Contracting moves

Terry Contracting, Inc., and Terry Steel Contractors, Inc., has moved to 11-11 34th Ave., Long Island City, N. Y. All departments—sales, engineering, executive, equipment maintenance, and supplies—are now consolidated in the new headquarters.


There's a big difference between B.F.Goodrich Hi-Torque Brakes and conventional two-shoe brakes. It's called *full circle stopping power.*

Here's how it works. Each of the segmented shoes is forced by hydraulic actuation radially against the inside of the brake drum. This exclusive design gives more useful lining contact area, greater than any other comparable size drum brake. And because of the non-servo hydraulic actuation, each of the shoes follows drum eccentricities without "grabbing".

Just how effective are B.F.Goodrich Hi-Torque Brakes? They give you smoother, faster, safer stops with far less chance of fade. For example, a popular 24-ton capacity truck equipped with these new brakes achieved a deceleration rate of 18 Ft/sec$^2$. The same truck equipped with conventional two-shoe brakes stopped at a rate of only 7 Ft/sec$^2$. Both tests were run under the same load conditions and at the same speed.

No matter what kind of wheeled off-road vehicles you use, B.F.Goodrich Hi-Torque Brakes can help your operators cut cycle time, cost.

You'll find that simple, rugged construction and automatic adjustment reduce maintenance time, too. Find out how you can get B.F.Goodrich Hi-Torque Brakes on your new, larger equipment. Write: *B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Troy, Ohio.*

**B.F.Goodrich** ***Hi-Torque brakes***

For more facts, use Request Card at page 18 and circle No. 259

When snow starts in the Donner Pass area of the Sierra Nevada range, equipment hits the road. This Pettibone Mulliken motor grader clears a road in the Lake Tahoe area with a front-mounted Snogo.

# Rotary plows and graders fight snow in mountains

Winter Work

***Salt and sand are used to combat ice and snow and keep traffic moving over highway in the Sierra***

Rotary snowplows and motor graders lead the snow-removal battle in the high Sierras to keep U. S. 40 over Donner Summit open the year round. Supporting equipment includes trucks, plows, sanders, and salt spreaders. Skilled operators, following a careful plan of attack, get the machines into action as soon as snow strikes.

For highway superintendent Frank Fox and the men of the Truckee Maintenance Territory in District III of the California Division of Highways, snow removal is practically a year-round job. And it's a tough one. All of the 193 miles of road in the territory are in the Sierra Nevada mountains. The most heavily traveled route is U. S. 40 from the Nevada state line to Gold Run, Calif.—the well known Donner Summit route.

### Long season

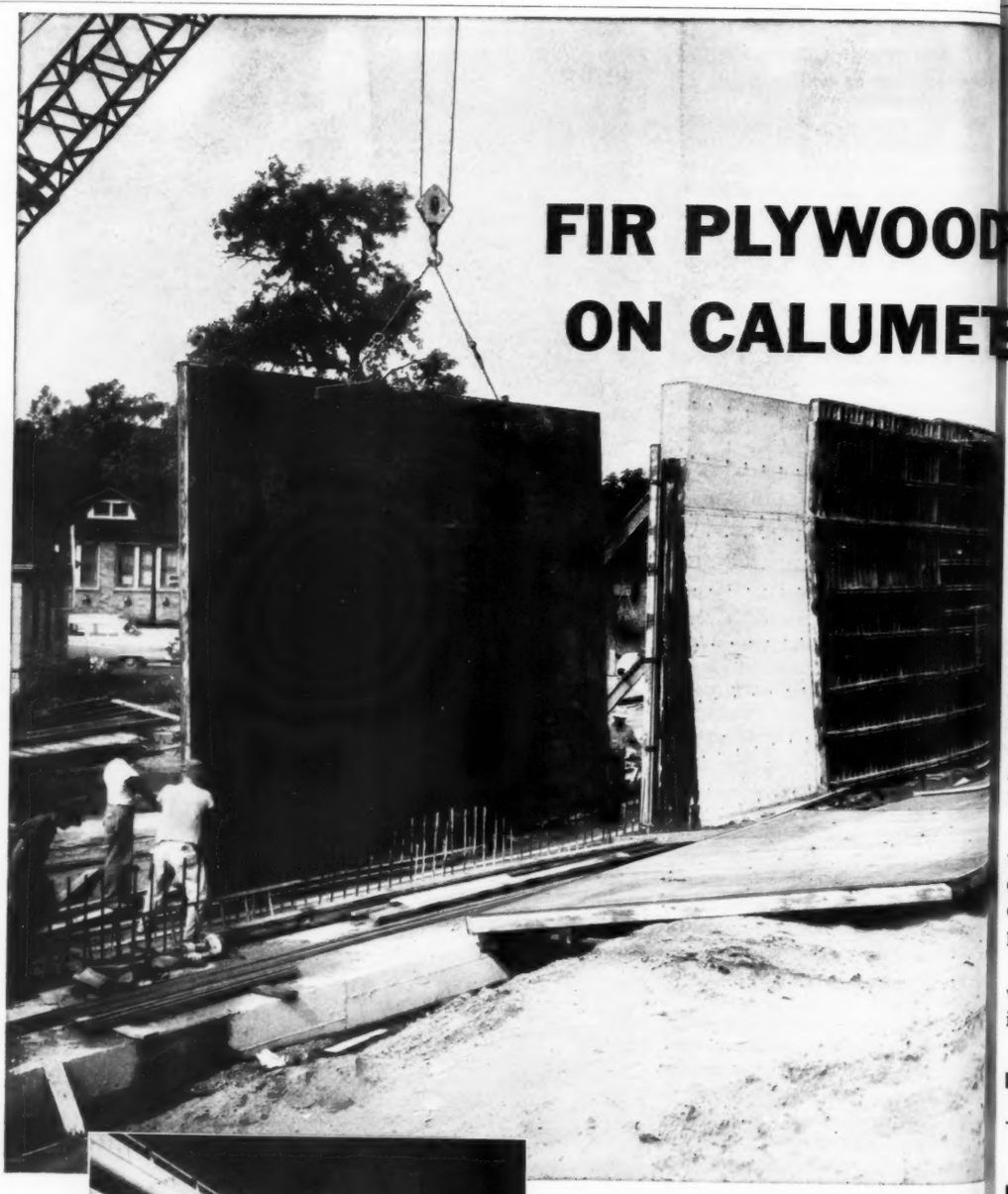
Snow pack during an ordinary winter is expected to total 175 inches. Some years bring much more. The last 10-year average for snow pack—excluding the present year—is 408.2 inches. The first snow can be expected in September, and the last may come as late as May or early June. Winter is long in these high altitudes.

The snow-free months provide just about enough time to get equipment and materials ready for the next winter's operation. When the snow starts to fly, each machine must be in the best possible condition. To assure this, every piece of equipment is completely overhauled each summer in the headquarters shops in Sacramento.

### Work starts in summer

Before winter sets in, the rigs are back in the five sections that comprise the territory, each section with its own garage and equipment under the supervision of a section foreman. A central shop and yard in Truckee serve as a territory maintenance shop, and as headquarters for men and equipment that can be dispatched to any section with unusual needs.

Equipment currently in use in the territory includes seven rotaries mounted on trucks. A new rotary, received last winter, is mounted on a motor grader. It is powered by


*Big prefabricated fir plywood form sections helped cut costs, speed work on 8-mile long Calumet Skyway.*

CALUMET SKYWAY TOLL BRIDGE LOCATION
West end of Indiana Toll Road to downtown Chic
COORDINATING ENGINEERS:
De Leuw Cather & Company
CONTRACTORS FOR FORMWORK:
R. R. Anderson Co., Chicago
Arcole Midwest Corp., Skokie, Ill.
M. J. Boyle & Co., Chicago
J. M. Corbett Co., Chicago
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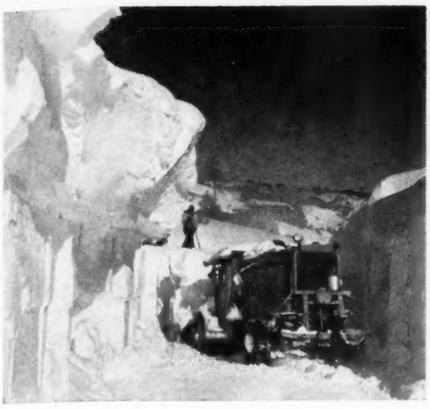


Fighting through deep drifts, a Snogo is unable to reach high enough and leaves an overhang at the top of the bank. Men on snowshoes break off the overhang.

The Snogo comes back to blow a stream of snow high and clear of the road. Sometimes, a cable is dragged

above the overhang and the ends attached to two pieces of equipment. When the rigs pull back from each other and make the cable taut, it slices through the overhang.

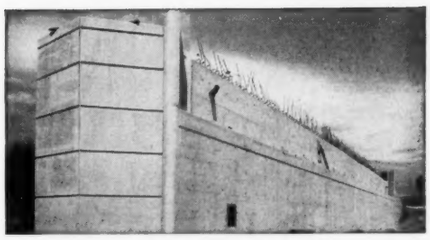
# ODFORMS SPEED CONCRETING ETSKYWAY TOLL BRIDGE

GIANT FIR PLYWOOD FORM SECTIONS, as large as 28′ x 31′, played an important role in keeping work moving at a near record clip on the new eight-mile long Calumet Skyway which links the Chicago business district with the Indiana toll road.

The job features one of the world's longest retaining walls along three of the eight miles. Over 30 feet tall in places, the wall was formed by leap-frogging the big prefabricated plywood form sections. In most instances, forms were built to maximum wall height and simply cut down for shorter walls. Plywood forms were also used for abutments at street crossings and for beams and bridge decks on overpasses.

Plywood was called for in the job specifications for uniformly smooth concrete, but contractors on the job credit plywood's ease of fabrication and handling—coupled with a high number of re-uses (up to 15 or 20 pours)—with holding down costs as well.

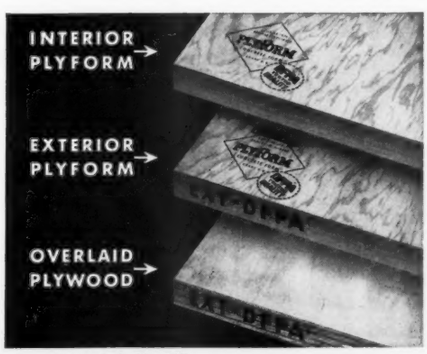
All told, over 300,000 square feet of plywood forms were used by the five contractors concerned with pouring walls, abutments and decks.



*Rustication lines on walls and abutments were achieved by nailing strips to face of plywood forms.*

*Fir plywood was also used for forming reinforced concrete beams and deck slabs on entrance ramps.*


**DOUGLAS FIR PLYWOOD ASSOCIATION**
TACOMA 2, WASHINGTON
–a non-profit industry organization devoted to research, promotion and quality control




DFPA TESTED QUALITY

**ALWAYS SPECIFY BY DFPA GRADE-TRADEMARKS**

Letters DFPA indicate material has been inspected and tested under rigid DFPA-Industry quality control program. Grades manufactured expressly for concrete form work include:

*INTERIOR PLYFORM®—standard concrete form grade plywood made with moisture-resistant glue. Gives multiple (10-12) re-uses.*

*EXTERIOR PLYFORM®—standard concrete form grade plywood made with waterproof glue to give as many as 25 or more re-uses.*

*OVERLAID PLYWOOD—special panel with hard, glossy, plastic-like fused resin fiber surfaces. Forms smoothest concrete; up to 200 re-uses.*

For more facts, use Request Card at page 18 and circle No. 260


two engines mounted on either side of the grade frame in the position usually occupied by the blade circle. A ninth rotary in use is equipped with a chute for loading snow into trucks whenever it cannot be blown away. The territory has eight motor graders, five equipped with snowplows. Eight big 5-ton four-wheel-drive trucks are equipped with plows. Eleven 2-ton trucks are equipped with snowplows, and these also assist with sanding and salt spreading. Three 5-ton trucks are equipped with sand spreaders for applying sand to slippery roads.

Salt has become an important snow-fighting element, and the territory has five salt spreaders which are easily attached to a number of the trucks.

### Set snow markers

During the summer while the equipment is being overhauled, supplies of sand and salt are put into storage for the next winter. Dry concrete sand is purchased from local producers and stored in sand bunkers or in outdoor stockpiles covered with Sisalkraft paper. A motor crane with clamshell bucket builds the stockpiles as the material is delivered.

A tractor shovel and a front-end loader transfer the sand from stockpiles into the trucks which do the spreading. The spreaders are attached to the truck tail gates so that, when the box is raised, the spreader wheels contact the pavement and operate the spreader. During an ordinary winter, some 6,000 tons of sand are required.

A supply of some 1,700 tons of rock salt is also put into storage in the five sections during the short summer season. The salt, in 50-pound sacks, is stored in warehouses.

One very important task remains to be done before the ground freezes in the fall. Snow markers must be erected to delineate the road so that snow-removal crews will be able to find the road, stay on it, and get the entire width cleared.

These snow markers are 12-foot-long 2 × 2 wood posts, 12-foot-long U-shaped metal fence posts, or 12-foot markers of similar material. They are driven into the outer edge of the roadbed wherever deep drifts might hide the edge of the road. On curves and

After the storm, a Snogo, right, widens the roadway, cleaning up after an Austin-Western motor grader. The grader slices through high drifts with a 12-foot-long standard blade and an 8-foot cutting bar extension. Cars are off the roadway here, but after a fresh fall of snow, cars parked on the roadway can make a tough job more difficult for snow crews.

high embankments, the stakes are placed relatively close together. On tangents, they are set farther apart.

#### Plow when snow starts

The goal of the maintenance forces is to keep the pavement bare, but since this is not always possible during snow storms, they concentrate on keeping the road open to traffic during storms and get back down to bare pavement as soon afterward as possible.

Plows hit the road almost as soon as it starts snowing and continue operating as long as the snow lasts. Experience has proved that the heavy truck traffic soon compacts the snow into a pack which is virtually ice. This is difficult to remove later. By keeping the accumulated snowfall on the pavement to a minimum, the crews minimize the depth of the pack and the after-storm cleanup job.

Since much of the highway is relatively narrow mountain road with rock banks on one or both sides, there is little room for the plows to push the snow to the sides. This is where the rotaries take over. As soon as the motor graders and truck plows are on the road, the rotaries start out right behind them, removing the snow which the plows push to the edge and casting it far to the side. This operation continues as long as there is snow to plow.

When a road has been cleared, the rotaries clean up parking areas within the right-of-way near ski resorts and other business places so that cars can park off the road. They also load snow from the streets of Truckee, the only town of consequence on this section of the highway.

In spite of the work of the plows and motor graders during the storm, some pack often accumulates by the time a snowfall stops. Getting rid of it is strictly a job for the motor graders, and a light application of salt makes their job easier.

Trucks equipped with spreaders apply salt to the pack at the rate of three to six sacks per mile. More salt is used on a very heavy pack or on ice. An attempt is always made to get the salt applied a couple of hours ahead of the cleaning operation to give it a chance to work.

A string of motor graders—possibly five machines spaced at 50-yard intervals—then removes the pack from half the roadway in a single pass. Again, the rotaries may be called in to clean up the material which the graders push aside and blow it up out of the roadway.

Although weather is very unpredictable in this area, temperatures are generally moderate during snow storms and drop shortly after. A normal temperature during a storm is in the mid-twenties; after the storm, it may drop below zero.

This means that the removal of the pack must be done as soon after the storm as possible. This is particularly true when salt is being used, since it is not effective at the very low temperatures.

#### Traffic is big problem

These snow-removal operations would be relatively simple, if it were not for the traffic. During a storm, most of this consists of average drivers attempting to get home or to shelter as fast as possible. In general, they give little consideration to other drivers or to the workmen trying to keep the road open.

When there is a wreck, or a truck jackknifes and blocks a road, oncoming vehicles usually line up in both di-

# WESTERN GOES FOR TORQMATIC

**POWERED BY A PAIR OF DIESELS**
—and equipped with twin TORQMATIC DRIVES—this 1LLD Euclid rear-dump takes a 50-ton load to the dam site. TORQMATIC DRIVE makes possible use of twin Diesels in this 1LLD, also makes it America's most powerful standard production truck.

WESTERN CONTRACTING CORPORATION of Sioux City, Iowa, is one of the best in the business when it comes to moving dirt on record-breaking schedules—and to meet the schedules they set for themselves, they turn to Allison TORQMATIC DRIVES every time.

Take their latest job – Oahe Dam near Pierre, South Dakota. Western's handling the big bulk of this Missouri River Valley flood control, irrigation and power project—doing most of it with 86 scrapers, trucks and tractors equipped with TORQMATIC DRIVES.

It's a big job by any measure—78,000,000 yards of earth,

**PART OF FLEET EQUIPPED**
with Allison TORQMATIC DRIVES working for Western Contracting.

**TORQMATIC-EQUIPPED EUCLID 17-LDT**
bottom-dump rolling away from Marion dragline.

rections. And instead of staying in line and awaiting their turn to move ahead, many drivers swing out into the other lane and go as far as they can. This frequently results in two or three lanes of cars completely blocking the highway, on either side of an accident.

It is often almost impossible for a tow truck to reach the site, and highway patrolmen assisted by the maintenance men spend hours trying to get the cars back into line so that both lanes may proceed after a wrecked vehicle is removed.

Parked vehicles are another nuisance. At a number of ski areas along the route, skiers frequently ignore the signs designating parking areas for lodges and restaurants and leave their cars in the roadway or projecting into it. Getting these cars out of the way delays snow removal and makes a great deal of work for the men of the State Highway Patrol, who always do what they can to assist the maintenance crews.

#### Chains reduce accidents

Tire chains are required on all vehicles when the road is slippery, and the maintenance men set up control stations at strategic points. When road conditions require the use of chains, men are dispatched in pairs to the control stations where they stop all vehicles and make sure they have the proper chains before permitting them to continue.

These men have learned a great deal about different types of chains, and particularly about chains on trucks. Trucks are sometimes required to have dual chains, sometimes single, sometimes both. Chains on the wheels of trailers and towed vehicles have been found very helpful in preventing accidents on downgrades.

Since manning the chain control stations is often a cold job, the headquarters shop has built a warming house on the rear of a truck to shelter the men. The house has electric heat and lights powered by a generator, a two-way radio, and a chemical toilet.

Two-way radio communication is extremely important to the men of the Truckee Maintenance Territory. Requests for help for machines in trouble, wreck reports, and communication of road and weather information are just a few of the messages that keep the mobile radio system buzzing almost constantly during storms.

**Truckee County snow equipment**

Eight Snogo rotaries, seven on FWD trucks, one on a Pettibone Mulliken grader
One Sicard rotary
Eight motor graders, four of them Austin-Western 99-M and 88's, one Galion, and one Warco.
Eight four-wheel-drive trucks. These include three Walters, three Colemans, an FWD, and an Oshkosh.
Eleven 2-ton Ford and Chevrolet trucks with snowplows and spreaders.
Five Tarco Scotchman spreaders
A Reo truck with warming house, equipped with a Kohler generator for heat and lights and a two-way RCA mobile radio system.

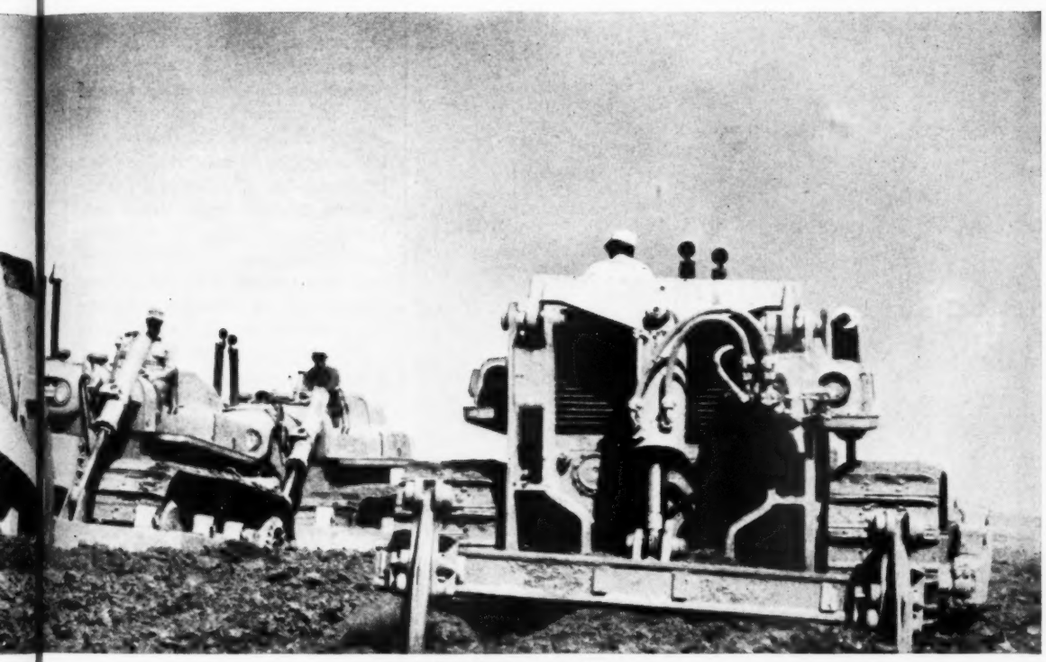
All but two of the rotaries have radios, two of the small plow units are radio-equipped, and all section foremen and assistant foremen have sets in their pickups. Units at each of the section headquarters and at the territory headquarters in Truckee complete the setup. The base station at the summit is connected to Truckee by wire so that headquarters can communicate with any or all rigs in the territory.

A unique interconnection with the highway patrol makes possible communication between the two agencies. One agency cannot broadcast on the other's frequency. Both base stations, however, have receivers on both frequencies. If the maintenance station sends a message, it will be heard at the patrol base station. The patrol can answer over its own radio.

#### Road is seldom closed

In January, 1952, when an estimated 70 inches of snow fell in a single storm, the highway was completely blocked for 28 days—from January 11 to February 8. During this time, 185 inches of snow pack was recorded at Donner Summit. By March 20, after the road had been reopened, continuing storms had left a pack of 320 inches at the summit. Since that time, the road has seldom been blocked.

A new kind of record was set late in the spring of this year. On March 27 at Soda Springs, there was a snow pack of 87 inches and a total snowfall of 392 inches. The road was closed to traffic at 7:20 p.m. on April 1 and

**1350-HORSEPOWER EARTH-MOVING**
combination is this team of two Euclid TORQMATIC-equipped TC-12 tractors and a TS-24 scraper. TORQMATIC DRIVES in tractors and scraper let only 3 men control 6 engines and 1350 h.p.

# o make the Oahe Dam job go faster

450 men working two ten-hour shifts six days a week, ten years for completion, a dam that will create a 376,000-acre lake with a 2350-mile shore line.

And to get that job done *on time* Western is running their TORQMATIC DRIVES almost around the clock. Euclid TC-12 twin-engine tractors team up in tandem to push-load "Euc" S-18 and TS-24 scrapers through tough-to-handle shale. Euclid 1LLD 50-ton end-dumps haul fill on split-second schedules. Euclid 17-LDT bottom-dumps haul wet earth from the spillway channel to the dam site almost every minute of the day.

How are the TORQMATIC DRIVES standing up? "Rip" Collins, Western's project manager, says no drive could do better. Only three hours a day are scheduled for equipment service—and you can't do much more than routine maintenance in that time. But the TORQMATIC DRIVES keep going day and night—and "Rip" says that "without the TORQMATIC DRIVES in these huge machines, we could never get the power we need to do this job on time."

If you want to get your contracts done faster and more profitably, take a tip from thousands of construction experts—put TORQMATIC DRIVES to work for you.

**ALLISON DIVISION OF GENERAL MOTORS, Indianapolis 6, Indiana**

Allison ★ TORQMATIC

**TORQMATIC® DRIVES**

For more facts, use Request Card at page 18 and circle No. 261

(Continued from preceding page)

The Pettibone Mulliken motor grader has a front-mounted Snogo powered by two GM 4-71 diesel engines on either side of the grader frame. They are in the position usually occupied by the blade circle. Another GM diesel powers for the grader.

opened at 4 p.m. on April 6. The total pack measured 231 inches on April 3, making it by far the greatest snowfall in the area at this time of year. But even though the road was closed, crews managed to get a hole gouged through the snow so that emergency equipment, fuel, and groceries could be moved through the road except on April 2 and 3.

When extremely high drifts accumulate, crews use some unusual methods in clearing the roads. The big drifts sometimes tower high above the cutting bars of the rotaries, and these rigs practically tunnel their way through. This leaves overhanging banks that have to be removed.

A special cutting bar attached to the blade of a motor grader has been effective in some cases. Typical of this type of device is a 14-foot section of cutting blade attached as an extension to one end of the 12-foot blade of a motor grader. The extension is braced back to the moldboard to give it rigidity. With its blade and this extension carried in a nearly vertical position, the motor grader slices off the overhanging banks, dropping the snow to the road where the rotary cleans it up.

Another device used on especially high banks is a cable. Workmen on snowshoes drag a long section of cable up on top of the drift which is to be cut away. The ends of the cable are then taken down to the road and attached to two pieces of equipment. As the machines move away from each other, the cable tightens and slices its way down through the snow, dropping the overhang onto the roadway.

These and other tricks are used only in extreme cases. Generally, crews start plowing with the start of the snowfall and keep at it without letup until the job is finished.

Under a series of construction contracts, some already completed, others under way, and some still in the design stage, the old Donner Summit highway is being transformed into a modern four-lane divided freeway. The completion of this series of projects will greatly lessen difficulties in keeping this road open in winter. The maximum grade will be reduced from the present 8 per cent to a maximum of 5 per cent. Curves will not be as sharp, and the new streamlined roadway section will provide much more room for snow pushed to the side.

### Personnel

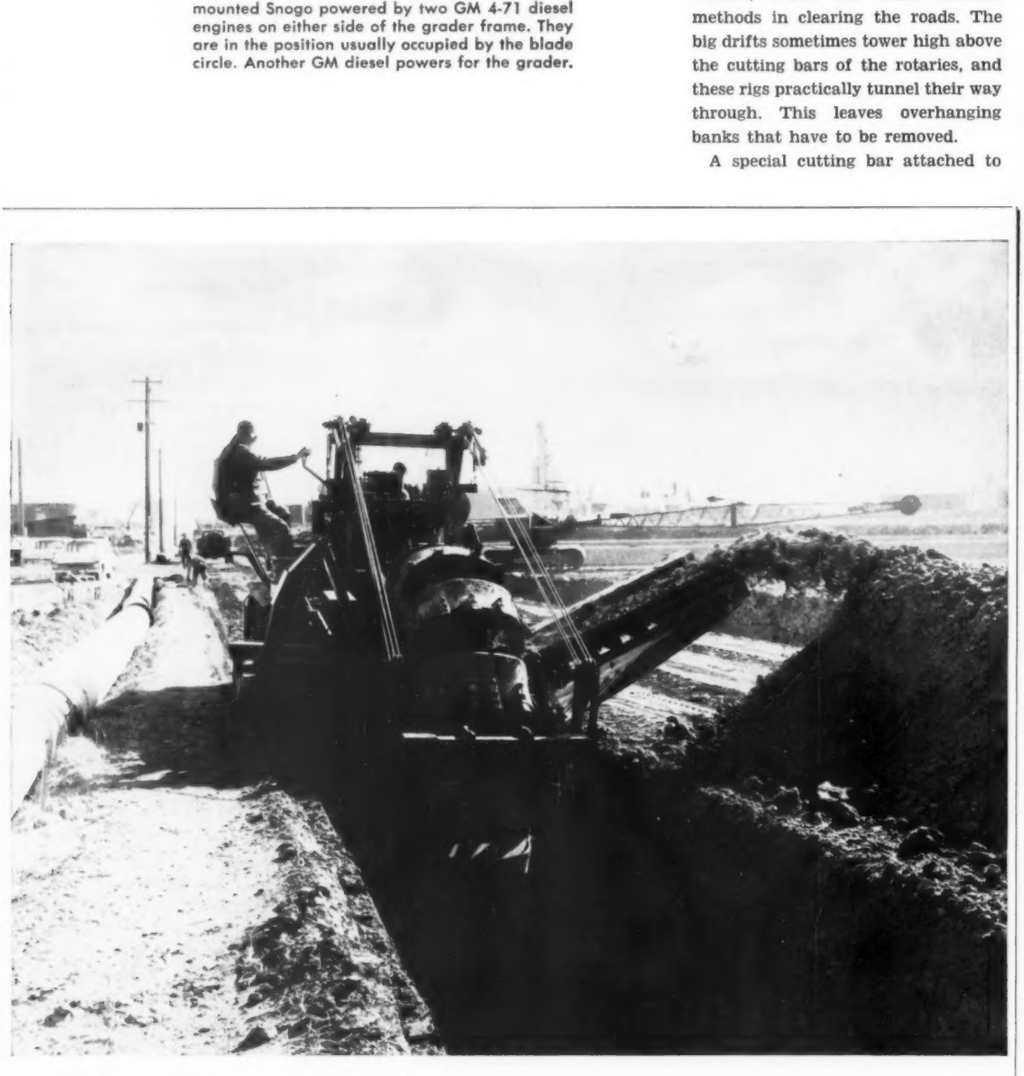
The man who supervises the maintenance operations for the Truckee Maintenance Territory is highway superintendent Frank W. Fox, who reports directly to district maintenance engineer R. I. Nicholson of District III at Marysville. The maintenance engineer for the Division of Highways of the California Department of Public Works is F. E. Baxter. State highway engineer and chief of the Division is G. T. McCoy. THE END

## Birmingham Mfg. Co. buys Jackson Industries plant

The Birmingham Mfg. Co. of Birmingham, Ala., has bought a building formerly occupied by Veneer Machines Division, Jackson Industries, Inc., in that city. Birmingham Mfg. Co. produces standard and custom-built low-bed machinery truck trailers, tile trailers, and special steel fabrication.

## Ulrich Mfg. appoints

M. E. Jenks has been appointed sales manager of Ulrich Mfg. Co., Roanoke, Ill., producer of graders, loaders, and other road machinery. He will direct field sales work, calling on the Ulrich-Caterpillar dealer organization.

# Sloped trench licks cave-ins on Denver waterline

**Digging 6 feet deep in loose sandy loam, this Cleveland 240 sloped trench from 90-inch top width to 34-inch bottom width, eliminating serious cave-ins. Picture shows its 30-inch wide, power-shift conveyor easily discharging the large-volume spoil.**

**Owner Fred Linneman of Denver uses his versatile 240 on many different types of trenching jobs, averages 20 feet of trench per minute on small mains and service lines in this area. Transport is no problem since the 240 is only 8 feet wide overall and its conveyor power folds to within this width.**

*The Cleveland 240 digs down to 6'3" deep, covers a wide range of trench widths. Get full information now.*

Good Everywhere

**The CLEVELAND TRENCHER Co.**

**20100 St. Clair Avenue • Cleveland 17, Ohio**

For more facts, use Request Card at page 18 and circle No. 262

## Greer Institute to open course for mechanics on construction machinery

A school designed to train skilled mechanics for construction machinery is being started by Greer Technical Institute, which also operates its Heavy Equipment Operators Division at Braidwood, Ill., some 50 miles from Chicago. (See "School Learnin' for Equipment Operators", CONTRACTORS AND ENGINEERS, June, 1958, page 110.)

The mechanics school, located in Wilmington, Ill., four miles from Braidwood, offers a 540-hour course that runs for ten weeks. Classes will be held 5½ days a week, ten hours per day, and will include 60 hours instruction in each of these departments: diesel engines, fuel injection systems, torque converters, final drives, steering system, tractor tracks, cable controls, welding, and dozer rebuilding.

All but two courses will be held in the completely equipped shops in the downtown area of Wilmington. The welding and dozer rebuilding courses will be held at the Heavy Equipment Operators School at Braidwood.

The school, with $100,000 invested in plant and equipment, came into being when Greer officials found a need existed for skilled equipment mechanics. After surveys of contractor and equipment manufacturer groups verified the need, Greer went ahead with its plans for a mechanic's course. The bulk of its enrollment is expected to come from contractors and distributor organizations.

Among subjects covered in the nine sections of the course are theory, construction, and repair of diesel engines; study and repair of turbo chargers; testing of fuel pumps in diesel fuel injection systems; torque multiplication and power trains as applied to construction machinery; final drive adjustments, and their disassembly and repair, with emphasis on planetary systems. The course also covers a thorough study of and actual work on tracks, rails, rollers, and sprockets; study of mechanical and hydraulically operated cable controls; and both gas and arc welding.

Information on starting dates, fees, and course details are available by writing the institute at 323 E. Baltimore St., Wilmington, Ill.

## Tuttle Engineering expands Alaska Division

Tuttle Engineering, Inc., Arcadia, Calif., has expanded its Alaska Division to meet the demand for architectural and structural design for construction in that state. The firm's engineers, draftsmen, and computers are now engaged in surveying and engineering roads, highways, and bridges in some of the most remote portions of Alaska under a $600,000 contract from the U. S. Army Corps of Engineers.

For the past four years, Tuttle has worked in Alaska on DEW line installations, missile sites, runways, roads, utilities, and other specialized projects.

LESSON IN PUBLIC RELATIONS at 410 Park Avenue in New York City, where Kleban Realty & Construction Co. is putting up a 21-story office building. The necessity for lifting 50-ton girders into place caused quite a traffic snarl, and Joan Distel, left, and Shirley Connelley are handing out "apology" cards explaining the reasons for the delay.

**Bethlehem Beam Guard Rail**
**Engineered for Safety**

Bethlehem Beam Guard Rail is fully tested for a minimum breaking strength of 80,000 lb, enough to distribute an impact force over at least 16 posts on either side of the point of collision.

Other advantages in using Bethlehem Beam Guard Rail: high visibility in bad weather or at night, easy erection, low maintenance, trim appearance. These sturdy beams are made from 10- and 12-gage steel.

Our catalog describes all these advantages in detail, and includes valuable engineering data. Just phone or write our nearest sales office for your copy, or write us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
*Export Distributor:* Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**

BETHLEHEM STEEL

For more facts, use Request Card at page 18 and circle No. 263

## Labor review

### AFL-CIO executive council abolishes aid agreements with Teamster Brotherhood

AFL-CIO's executive council, recently convened in regular session, lost no time in telling affiliated unions that they must cancel their mutual-aid or similar agreements with the International Brotherhood of Teamsters or any other union cast adrift on corruption charges.

As explained by AFL-CIO President George Meany, the order applies to all alliances—both formal and informal—at the international level. The council will decide later what is to be done in the case of area and city pacts between the Teamsters and local AFL-CIO unions. The council said its order, adopted as a "policy statement", will not interfere with union members "behaving like trade unionists".

Local members will not be forbidden to observe Teamster picket lines or to give other cooperation that is within the framework of "traditional" union assistance, according to Meany. But he saw no ground for speculation that local cooperation will permit "back-door" deals allowing the Teamsters to keep a foot in the federation's camp. He emphasized that AFL-CIO locals have permission to deal with Teamsters only on a "decent, trade union" basis, which means they can honor bona fide picket lines.

Explaining that AFL-CIO isn't trying to "punish Teamster members", President Meany said, "our fight is with the corrupt leadership of this union (IBT)." He made it clear that he believes the rank and file membership and most local leaders of the ousted union are honest.

But Meany also indicated there will be a crack-down on federation policy that a Teamster holding an administrative or policy-making office in his union may not, through holding membership in another union, have an office in an AFL-CIO state or city central body. He said that if such Teamster officers are elected to federation central bodies, their delegate credentials will be nullified.

### Tension slackened in Beaumont-Port Arthur, Texas, area as strikers meet with mediator

Tension in the Beaumont-Port Arthur, Texas, area eased as agreement on a new contract between the Laborers Union and the Sabine Area Construction Committee was announced and the striking Carpenters and Iron Workers met with contractors and a federal mediator.

The carpenters had been out since July 14; iron workers hit the bricks a week later, and 11 major SACC projects were shut down.

The laborers' new agreement will run for three years. Wages were increased 12½ cents an hour immediately, 10 cents next year, and 10 cents in 1960. The first increase brings the hourly scale to $2.

### NLRB grants time extension to unions, contractors subject to Brown-Olds doctrine

Apparently convinced that employers and unions are trying hard to bring the security and hiring provisions of their contracts into conformity with the standards of the Mountain Pacific decision of last April, General Counsel Fenton of the National Labor Relations Board served notice that they would have two additional months to get matters straightened out before they will be subject to the stiff reimbursement remedy of the Brown-Olds doctrine.

Fenton made it clear, however, that this was not an across-the-board reprieve from the previously announced September 1 deadline. He said that while parties may have encountered "unavoidable delays" in renegotiating their contracts, circumstances did not warrant a "general extension of the policy of withholding the full application of the Brown-Olds remedy beyond September 1."

But, the General Counsel continued, "where the parties have initiated steps and have made genuine efforts to correct their union security and hiring arrangement prior to the September 1 deadline, the full application of the remedy may be withheld provided that conformity with the Act is achieved by November 1, 1958."

Requests for another extension were said to have come mainly from the construction industry, where Brown-Olds hits hardest, and Fenton indicated that both employer and union representatives asked for the additional time. It is understood that a delegation of building tradesmen, following through on a decision made during the Building Trades Department's recent executive council meeting, asked for a blanket postponement until the end of the year.

Principal argument for the delay seems to have been that Fenton's lengthy statement answering questions about the new hiring hall criteria was released so near the Sep-


# From one to a fleet

## with Allis-Chalmers Construction Machinery

Starting with a single tractor-dozer in 1949, R. Sam Krage Company of Sioux City, Iowa, now owns a fleet of Allis-Chalmers construction machines. Sam Krage attributes much of his success as a dirt mover to the operation and performance of his equipment, and to the top-notch service his Allis-Chalmers dealer provides.

*Sam Krage, Sioux City, Iowa*

Big TS-360 motor scrapers are heaped to 20-yd capacity with help of the 225-hp HD-21 crawler tractor. Krage especially likes the ease with which these machines handle wet dirt.

**Look ahead... *move ahead*...and stay ahead with**

tember 1 deadline that negotiators could not draft new contract language within the time limit.

The Brown-Olds remedy requires parties to an illegal hiring agreement to repay all dues and assessments collected under that agreement for a six-month period prior to the unfair-practice finding.

### *8-week iron worker strike in upstate New York settled by special panel*

Iron workers in upstate New York ended an 8-week strike, settling for 40 to 42½ cents more an hour over two years.

For iron workers in Albany, Binghamton, and Utica, the two-year contracts increased wages 15 cents an hour this year, to $3.67½ an hour, and add 2½ cents an hour to the already set 7½-cent health-welfare contribution.

Iron workers in Rochester, Syracuse, and Elmira received 17½ cents an hour more in wages, to bring them up to $3.67½ an hour, and also 2½ cents additional for health-welfare. On June 1, 1959, the estimated 2,000 workers will get 12½ cents more an hour in their pay envelopes, and ten cents for pensions.

Other contract changes included a provision for 8 cents a mile travel pay, outside a ten-mile free zone, with a $5 a day ceiling, and two hours show-up time. The travel pay provision replaced a previous practice in some areas of a flat 25 cents an hour premium payment.

The union had asked for a 47½-cent, two-year package. The settlement accepted followed the recommendations of a special three-member panel, appointed by the State Mediation Service.

### *Expensive construction tie-up ends in Oregon as operating engineers settle*

A $400 million construction tie-up in Oregon ended as the operating engineers agreed to go along with a three-year contract that will hike wages a total of 65 cents an hour and establish a pension plan. An identical settlement was accepted earlier by the teamsters.

The agreements, covering members of both unions in Oregon and southwest Washington, call for 25 cents an hour more, retroactive to March 31, 1958, on all established classifications. In addition, new classifications were set up, as of August 18, 1958. Another 25 cents an hour will be added to wages on March 31, 1959, and a final 15 cents an hour on March 31, 1960.

Old rates ranged from $2.74 to $3.68 an hour for operating engineers, $2.60 to $3.10 for teamsters.

Contractors will begin putting 10 cents an hour into a pension plan on March 31, 1960, with a joint plan to be established for the engineers and teamster coverage under the Western Conference of Teamsters plan. The operating engineers already get 10 cents for health-welfare, while the teamsters have 7½ cents an hour put into a health-welfare fund.

Travel pay, one of the disputed points, was resolved with an agreement which will cover 35 Oregon towns and three towns in southwest Washington. The schedule, based on air miles, sets up a 15-mile free zone. Contractors will pay 75 cents from 15 to 25 miles, 85 cents from 25 to 35 miles, and $1.35 for over 35 miles. On March 31, 1960, the payments will be hiked to $1 from 15 to 25 miles, to $1.50 from 25 to 35 miles, and to $3 for over 35 miles.

Hiring procedures were another roadblock. Negotiations reportedly resulted in a clause which recognizes the union as the bargaining agents for employees, allows contractors to hire on a non-discriminatory basis or call for new hirees by name, and requires employees to become union members after 31 days.

### *"Unions, too, should pay for unfair labor practices", says N. Y. U. professor*

Prof. Sylvester Petro of New York University says in a newly published pamphlet that it would be difficult to improve on Taft Act mechanisms for discouraging union violence and coercion like some of the things the McClellan Committee has turned up. But the National Labor Relations Board, he holds, has failed to utilize effectively its powers of prevention and deterrence given it by law. He claims it has misconstrued the law, but holds present Board personnel blameless for the misconstruction.

Entitled "How The NLRB Can Stop Union Violence", Petro's pamphlet argues that NLRB has the authority to make unions pay for their unfair labor practices against workers, just as it makes employers come up with back pay for employees toward whom the employer has acted unfairly. He holds that the Board simply has refused to apply to union unfair practices the rules it has developed for deterring employer unfair practices.

Top production, day after day makes Allis-Chalmers tractor-dozers, like this HD-11 shown spreading fill, Krage's choice.

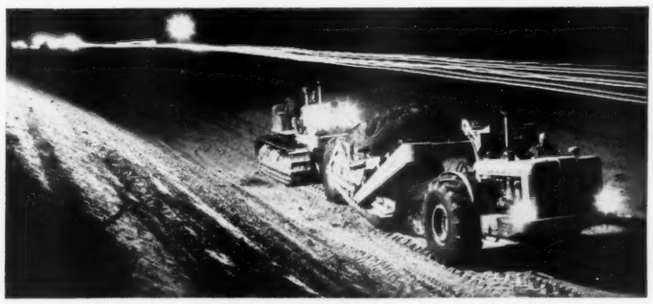
## Top production record on a wide variety of jobs

**From small farm pond and dam construction** with his first tractor, Krage branched off into clearing work for highway contractors. Since then he has moved into highway grading himself, both in Iowa and South Dakota. He also has done levee work on the Missouri River, and most recently handled a big air base job at Sioux City.

In this wide range of construction jobs, Sam Krage says he has benefited from an outstanding "time-on-the-job" record from his Allis-Chalmers equipment. Best proof of his confidence is the well-balanced fleet of Allis-Chalmers machines he now owns . . . big motor scrapers, crawler tractors, pull scrapers, and heavy-duty motor grader.

A number of the motor scrapers are TS-260's—rated 11 yd struck, 14 yd heaped. On a recent 800,000-yd highway job in Iowa, Krage says these machines loaded, hauled and dumped at the rate of 55 trips an hour on a 1,400-ft haul. On the Sioux City air base job, his TS-360's (15 yd struck, 20 yd heaped) handled 450 loads a day on average hauls of 1,600 ft.

On air base job, the Forty Five motor grader kept haul roads smooth, allowing the TS-360's to travel safely at high speeds.



Krage's teams of HD-21's and TS-360's kept production rolling on a night operation at Sioux City air base.

## Easy handling makes a big hit with operators

Krage says his operators like the way their Allis-Chalmers equipment handles, and that means extra production.

On the air base job, they were able to utilize the top horsepower-per-yard ratios in the TS-360's and TS-260's. Results—even in wet material, they loaded and hauled easily . . . and with positive, forced ejection, plus high apron opening, unloaded fast and clean.

Features designed for the operator's benefit on Allis-Chalmers tractors and motor graders are also considered important by Krage and his men. Torque converter drive on the HD-21 and HD-16 crawler tractors . . . and new toggle-type controls on the Forty Five motor grader are two examples. Both have the same effect—easier operation, more production.

## Proved quality in parts and dealer service important factor

Sam Krage made his first extensive purchase of Allis-Chalmers equipment in 1952, was so well satisfied with its operation and performance that he has continued to purchase it.

Krage says that parts availability and prompt dealer service figure high with him in purchasing the type of equipment he needs in his work. In both respects he's had extremely good relations with his Allis-Chalmers dealer.

Your local Allis-Chalmers construction machinery dealer is ready to help you with equipment and application recommendations, around-the-clock parts and service. Call him now for a working demonstration of the performance that sold Sam Krage. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

**with ALLIS-CHALMERS**

For more facts, use Request Card at page 18 and circle No. 264

Small parts move down a 468-foot-long conveyor belt to packers in the new Central Parts Division warehouse of Clark Equipment Co. in Chicago. The warehouse provides 24-hour service to any point in the country. IBM equipment to help plan inventories and a teletype service to speed orders are some of the new features of the plant.

## New parts warehouse gives Clark dealers fast service

Dealers and customers of Clark's Michigan equipment line now get faster parts service from the new Central Parts Division warehouse in Chicago.

With spare parts of all its divisions stored in one giant warehouse, Clark Equipment Co. can give its dealers 24-hour delivery to any point in the United States. Contractors, in turn, share the benefit.

IBM electronic equipment in the Central Parts Division makes it possible for further advantages to be passed on to dealer and customer. Teletype machines speed the sending and processing of the orders. Integrated data-processing equipment "memorizes" thousands of facts each day on what parts have needed replacing in what equipment. By looking over these records, Clark can tell the dealer approximately how many spare parts he should keep on hand for a certain piece of equipment. With this knowledge, the dealer is able to keep a very practical inventory of items for which there is apt to be a call.

Clark is one of the first manufacturers to offer distributors a teletype service. By typing out an order on a Western Union Teletype, a dealer's secretary can transmit the order to the Parts Depot as fast as she can type. The order is automatically typed on a receiver machine at the Parts Depot. At the same time, the order is also recorded on punched paper tape. The paper tape is used to transmit the order to other departments within the depot as well as to tabulate the information on an IBM card. The electronic machines speed the paper work and cut down on human error. At present some 120 Clark distributors (in all divisions) subscribe to the teletype service.

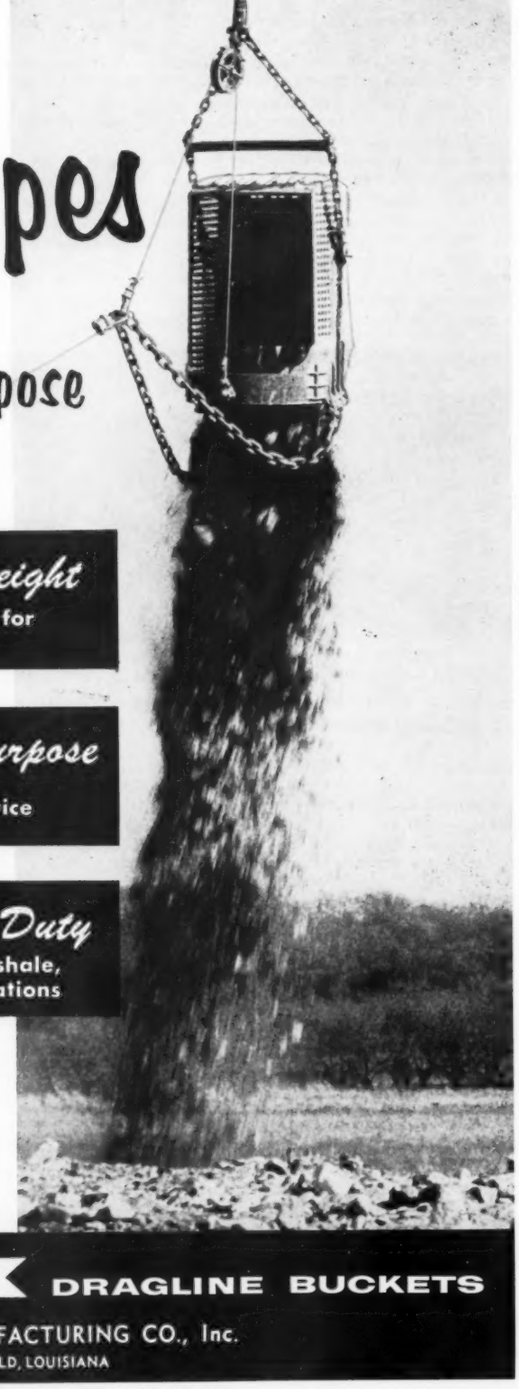
Two types of orders are filled at Central Parts—high-priority "breakdown" orders, which are filled the day they are received, and replenishment stock orders, which are usually on their way to distributors within three days.

Handling of smaller parts is expedited by a 468-foot-long conveyor belt which runs between rows of bins, receiving parts and carrying them to the shipping room. Each is picked off the belt, wrapped, and put into a shipping box according to a color code. Large items are handled with Clark fork-lift trucks and powered hand trucks.

The 7-acre warehouse, 10 minutes from Midway Airport, is surrounded by truck terminals and has a rail siding at the rear. The $3.5 million building stocks over 4½ million parts for equipment made by the Construction Machinery Division, the Industrial Truck Division (fork lifts), Automotive Division, and Clark-International.


3 types

for every digging purpose



**TYPE "LS" . . . *Lightweight***
A lighter weight bucket designed for levee and drainage work

**TYPE "TS" *General Purpose***
Unexcelled for Medium-Duty Service

**TYPE "HS" . . *Heavy Duty***
A heavy-duty bucket for moving shale, blasted rock and other hard formations

*All HENDRIX Buckets available without perforations*

¼ to 40 Cubic Yards

**HENDRIX** DRAGLINE BUCKETS

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

For more facts, use Request Card at page 18 and circle No. 265

## Bituminous base laid by new-model equipment

The newest model of a Wood Roadmixer, the 54A, was used to form a 6-inch stabilized bituminous base course for county road improvements near Brunswick, Ga. The new model, manufactured by the Pettibone Wood Mfg. Co., North Hollywood, Calif., has many improvements not possessed by its predecessor, the Model 54.

The new Pettibone Wood Roadmixer Model 54A, pulled by an International TD-24, lays a 6-inch stabilized bituminous base course for a county road project in Georgia. A 5,000-gallon asphalt tanker feeds the 1,000-gallon tank atop the pugmill. Pneumatic-tire tandem axles at the rear of the mixer keep it from digging into the base course.

### Tandem wheels

Seaboard Construction Co., Brunswick, found that the tandem mounting of two pneumatic tires on each side of the mixer increased flotation and eliminated the "digging in" encountered with the single-axle Model 54. The tandem axles helped maintain the Roadmixer in a level position while it was pulled by an International TD-24 tractor at an average mixing speed of 22 fpm.

Another improvement is the direct drive between the rotor shaft of the mixer and the rear power takeoff of the tractor. To power the mixer, it must be attached to an Allis-Chalmers HD-19, a Cat D8, or an International TD-24 tractor. It is equipped with two Chrysler gasoline engines. One powers the pump between the truck tanker that delivers the heated asphalt and the 1,000-gallon tank atop the pugmill. The second engine powers the pump which supplies the pugmill injectors with asphalt. It also powers the hydraulic lifts which raise and lower the mixing drum.

The Wood 54A Roadmixer can mix a stabilized bituminous base course up to an 8-inch compacted depth. Using the adjustable strike-off boards, the machine can cut the mix to a maximum width of 10½ feet.

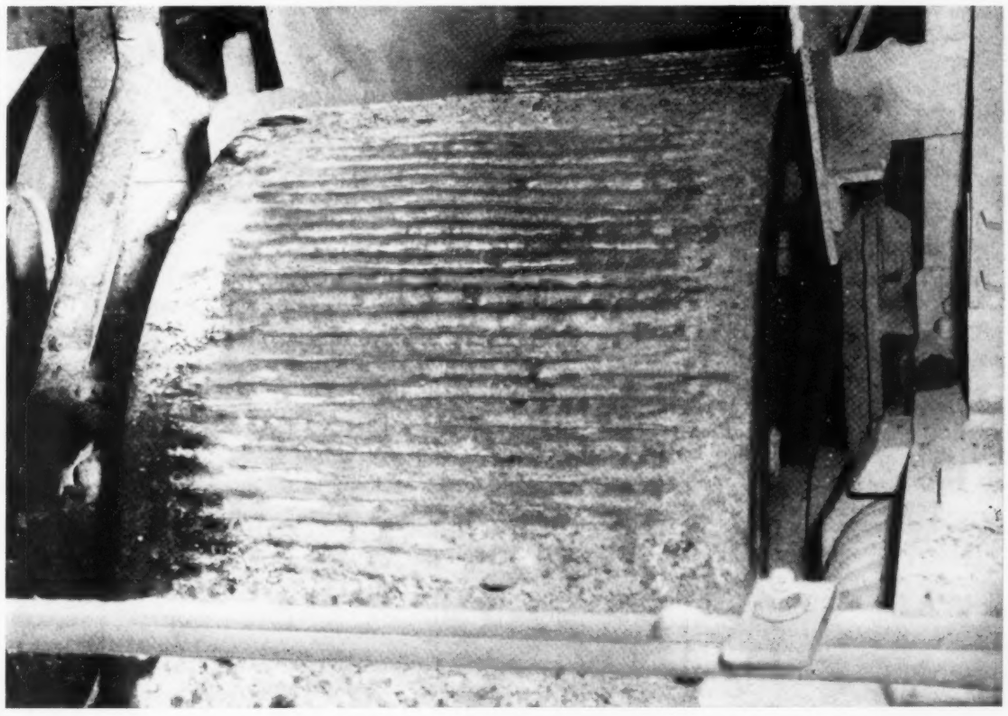
Seaboard Construction used approximately 380 gallons of asphalt, heated between 140 and 180 degrees, per 100 linear feet of roadway on this county road project. Heated asphalt was delivered to the mixer by 5,000-gallon truck tankers which rode alongside the tractor-mixer setup.

## M-F division appoints

Lyle W. Kahler has been appointed product and service training manager of the Massey-Ferguson Industrial Division, Wichita, Kans. Kahler has been with the company since 1944 in both service and sales capacities. His new responsibilities include nationwide product and service training among the firm's personnel and dealers.

## Le Roi moves offices

The executive and sales offices of the Le Roi Division, Westinghouse Air Brake Co., Milwaukee, are now located at 1706 S. 68th St. These offices were formerly at 3716 W. Wisconsin Ave.

This roller, hardfaced with Victoralloy, shows practically no wear after crushing 40 tons of rock hourly, 8 hours daily for 30 days.

# HOW TO SAVE ON ROLLERS AND ROD

## ....*Use VICTOR Hardfacing*

Tracy Rock & Gravel Co., Tracy, Calif., crushes 40 tons of rock hourly, prolongs roller life on this rough work by rebuilding with ¼" VICTORALLOY #1 Bare Electric rod, 28" length. Says plant superintendent Albert Parker:

> "Victoralloy's ease of application and fast buildup mean a lot to us. There is no lost time as we use 28" length rod; when it burns down, we touch a new rod to the old one, and keep on welding without even lifting the helmet."

You, too, can save rod and increase working life of crusher rolls, screens, shovel teeth, tractor rollers and idlers, dredge pumps and many other parts subjected to abrasion and severe impact. Simply hardface with VICTORALLOY. It welds to manganese, steel or cast iron. You get all position hardfacing, exceptional arc stability, deposits free of porosity, fast application without slag interference. Try it. Order a supply from your VICTOR dealer TODAY.

• FREE •
Victor Hardfacing Manual shows you right rod to use and how to apply it.
Write us NOW for your copy.

Profitable dealerships open; inquire now!

37 VICTOR for hardfacing

VICTOR EQUIPMENT COMPANY
ALLOY ROD AND METAL DIVISION
13808 E. Imperial Highway, Norwalk, Calif. • Wakita, Oklahoma

For more facts, use Request Card at page 18 and circle No. 266

## Manufacturer moves

Ralph J. Chrobak, vice president in charge of sales for Buck Equipment Corp.

The new vice president in charge of sales for **Buck Equipment Corp.**, Cincinnati, Ohio, is **Ralph J. Chrobak.** He was previously sales manager for the company, which manufactures portable hoisting machinery for the building construction industry.

**E. T. Cuddeback** has been promoted to manager of general products division sales of the Southeast region for **Allis-Chalmers Mfg. Co.**, Milwaukee, Wis. With headquarters in the firm's regional office in Atlanta, Ga., Cuddeback will be responsible for the promotion, planning, and coordination of sales through the district offices, for A-C motors, pumps, motor controls, and Texrope drives.

Cuddeback was formerly manager of the company's Florida district.

**The Thew Shovel Co.**, Lorain, Ohio, has appointed **R. J. Bushong** to the newly created post of director of product. He will have complete administrative authority and responsibility in the Product Division, which will combine the operations of the Engineering Division and the Research and Development Division, and

R. J. Bushong, director of product for Thew Shovel Co.

will cover both the Lorain line of power shovels and cranes and the Moto-Loader front-end loaders.

At the same time, **O. von Mehren** has been promoted from chief design engineer to manager of the Product Engineering Department. He will supervise and be responsible for all activities of the Engineering Division. **R. H. Zeilman**, director of engineering for the past four years, will undertake specific consulting assignments on engineering, research, and development projects as part of the Product Division's activities.

**George A. Smith** has been appointed traffic manager for the western region of the **Universal Atlas Cement Division** of United States Steel Corp., New York City. Headquartered in Kansas City, Mo., he is responsible for traffic and transportation matters relating to the firm's plants at Duluth, Minn.; Independence, Kans.; Waco, Texas; Hannibal, Mo.; and the division's gypsum operations at Watonga, Okla.

**James W. Macri** and **Robert Katz** have joined the Engineering and Construction Division, **American Cyanamid Co.**, New York City, as senior engineers. Macri was formerly a project construction manager with the Celanese Corp. of America. Katz was previously principal mechanical engineer in the High Energy Fuels Division, Olin Mathieson Chemical Corp.

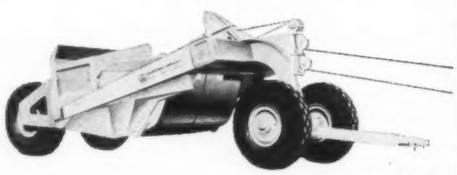
**Dorsey Trailers, Inc.**, Elba, Ala., has appointed **William F. Hutchens** a regional sales manager in Caracas, Venezuela, to serve customers in Central and South America. Hutchens will establish strategically located distributorships for the Dorsey lines —trailers, truck bodies, and self-unloading bulk cargo bodies and trailers.

Robert N. Swift, left, vice president and Midwestern manager, and Harold A. Jones, vice president and Eastern manager, of Motorola Communications & Electronics, Inc.

**Harold A. Jones** and **Robert N. Swift** have been appointed vice presidents and Eastern and Midwestern manager, respectively, of **Motorola Communications & Electronics, Inc.**, Chicago, Ill., a wholly owned subsidiary of Motorola, Inc. Jones replaces **Lowell E. White**, who will be working on special assignments for the vice president and general manager of the sales organization.

From Ridgefield, N. J., headquarters, Jones will be in charge of the 15-state Eastern seaboard area, from Maine to South Carolina, and West Virginia. Swift, who takes over Jones' former post of Midwestern manager, will have headquarters in Chicago and will be in charge of the area bounded by and including North Dakota, Kansas, Kentucky, Ohio, and Michigan.

**J. C. Mabe**, vice president in charge of plant operations for the **Chicago Pneumatic Tool Co.**, New York City, has been elected to the board of directors of the firm. Mabe joined the company in 1955.

**MODEL CWT-8** 8.0 cu. yds. STRUCK 10.5 cu. yds. HEAPED

AVAILABLE IN 10.0 and 13.5 CU. YDS.

**MODEL CW-27** 7.0 cu. yds. STRU 10.0 cu. yds. HEA

**MODEL CWT-15** 15.0 cu. yds. STRUCK 21.0 cu. yds. HEAPED

**MODEL CW-215** 15.0 cu. yds. STR 21.0 cu. yds. HEA

INTERCHANGEABLE WITH MODEL CWD-214 REAR DUMP UNIT

**MODEL CWT-20** 20.0 cu. yds. STRUCK 27.0 cu. yds. HEAPED

**MODEL CW-220** 20.0 cu. yds. STR 27.0 cu. yds. HEA

INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

**MODEL CWT-26** 26.0 cu. yds. STRUCK 33.0 cu. yds. HEAPED

**MODEL CW-226** 26.0 cu. yds. ST 36.0 cu. yds. HE

INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

**Leo A. Thomsen** and **Leonard Dvorak** have been appointed district sales representatives for the Cedarapids line of aggregate-producing, bituminous-mixing and paving equipment produced by **Iowa Mfg. Co.**, Cedar Rapids, Iowa.

From headquarters in Calgary, Alberta, Canada, Thomsen will cover western Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. Dvorak, with headquarters in Portland, Ore., will serve California, Nevada, Oregon, and western Washington.

The **General Tire & Rubber Co.**, Akron, Ohio, has appointed **Charles E. Gibbs** as South-Central division manager of building materials. He has headquarters in Houston, Texas. The firm has also promoted **John D. MacArthur**, formerly a special sales representative in the Dallas, Texas, area, to assistant division manager of the Cincinnati division.

**Frank V. Donaghue**, formerly the firm's Baltimore, Md., territory salesman, has been named manager of truck-tire sales for the Philadelphia division.

**W. O. Bechman** and **Merrill R. Bennett** have been appointed assistant to the general manager and manager of engineering, respectively, of the **Construction Equipment Division, International Harvester Co.**, Melrose Park, Ill. In his new position, Bechman will study the needs of the industry and make recommendations for improvements and new design.

Bennett, who takes over Bechman's former post, was previously assistant manager of engineering.

**Myron F. Pipes** has been named representative for the Central Sales District of **Electric Steel Foundry Co.**, Portland, Ore.

**John Oliver**, who formerly worked with original equipment manufacturers, will move into the central sales office.

**Graham Ross** has been appointed manager of the truck and big mixer section of the Plainfield, N.J., division of **Worthington Corp.**, Harrison, N. J. Ross, who is also manager of the division's paver section, succeeds **V. H. Berg**, who resigned to assume other duties.

Carl L. Hecker, president of The Oliver Corp.

**Carl L. Hecker** has been elected president of **The Oliver Corp.**, Chicago, Ill. Hecker succeeds **Alva W. Phelps**, who will continue to hold the positions of chairman of the board and chief executive officer.

The board of directors also elected **B. Haugen**, vice president and treasurer, to serve as chairman of its newly created financial committee. Others named to the committee are **Joseph D. Oliver, Jr., Samuel W. White, Sr., John R. Covington**, and **Hecker**.

**Alexander L. Bupp** has been appointed manager of planning for the **Bucyrus-Erie Co.**, South Milwaukee, Wis. Bupp, former assistant treasurer, will now be in charge of corporate planning, market research, organization planning, and office management. He will report to and assist the firm's executive vice president, **R. G. Allen**.

**John Sharda** has been named a district sales representative for the **Euclid Division, General Motors Corp.**, Cleveland, Ohio. From headquarters in the Chicago area, Sharda will cover Illinois, central and southern Wisconsin, eastern Missouri, part of Iowa, and Lake County, Ind.

**C. Q. Hagerty** has been assigned as district manager of distributor sales in southern California for **Parker-Hannifin Corp.**, Cleveland, Ohio. Hagerty will handle products of Parker Fittings & Hose Division, as well as accumulators and check valves made by Parker Hydraulics Division.

**W. H. Burns** has been promoted to the newly created post of eastern regional manager of the Resins and Solvents Division, **Velsicol Chemical Corp.**, Chicago. For the past nine years, Burns has been product development chemist and eastern sales representative for the company. He continues to make his headquarters in New York City.

**William P. Henson** and **Milton N. Thompson** have joined **Mobile Drilling, Inc.**, Indianapolis, Ind. Both men will be engaged in the design and development of new products for the earth-drill manufacturing firm.

**The Marine & Industrial Engine Division, Chrysler Corp.**, Detroit, has appointed **Glenn E. White** comptroller; **Raymond C. Davis** to the newly created position of director of planning and production control; and **Bruce B. Spratling** to the new post of parts sales manager.

Davis will direct activities of market research, production control, and distribution of products. Spratling will direct and plan the establishment of distribution standards for the division's new parts sales program.

**MODEL CW-320**
INTERCHANGEABLE WITH MODEL CWD-321 REAR DUMP UNIT
20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

**MODEL CWD-321**
INTERCHANGEABLE WITH MODEL CW-320 SCRAPER UNIT
21.0 cu. yds. STRUCK
31.0 cu. yds. HEAPED
35-TON LOAD CAPACITY

A SCRAPER FOR EVERY EARTHMOVING JOB . . .

CURTISS-WRIGHT

CONSTRUCTION MACHINERY

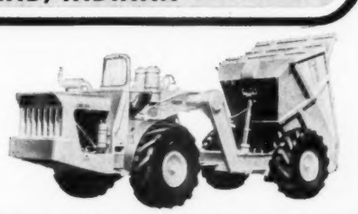
Curtiss-Wright Construction Machinery offers the most extensive scraper line in the industry! These rugged, dependable high speed machines — produced at South Bend — incorporate design features that give contractors the versatility and performance that pays off in lower costs-per-yard and bigger profits on any earthmoving job.

And supporting performance in the field is the nationwide network of Curtiss-Wright distributors with a staff of factory-trained service personnel and extensive parts stocks. Factory parts depots located strategically throughout the country cut downtime on major overhauls too.

For scraper performance that means bigger earth moving profits — see your Curtiss-Wright Construction Machinery distributor today.

SOUTH BEND DIVISION
CURTISS-WRIGHT CORPORATION
SOUTH BEND, INDIANA

**MODEL CWT-30**
30.0 cu. yds. STRUCK
39.0 cu. yds. HEAPED



**MODEL CWD-214**
INTERCHANGEABLE WITH MODEL CW-215 SCRAPER UNIT
14.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED
25-TON LOAD CAPACITY

For more facts, use Request Card at page 18 and circle No. 267

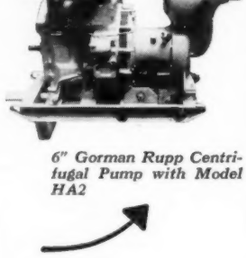
THE 145-FOOT BOOM of this Lorain Moto-Crane, Model MC-530W, rocks high and wide during the construction of an atomic reactor installation for the Atomic Energy Commission at the Wright-Patterson Air Force Base in Dayton, Ohio. Maxon Construction Co., Dayton, has the 35-ton crane mounted on an 8 × 4 carrier to roll it over the rough, snow-covered ground.


*Sound Hearts for Long Life!*

No application impossible with these air-cooled, versatile diesels

—by Lister

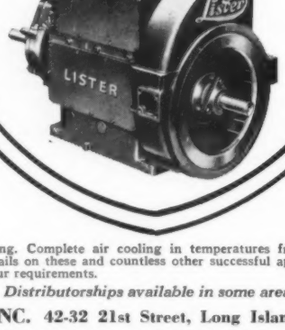
*2 KW Kurz & Root generator with Model LD1*



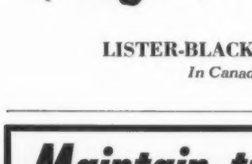
*6" Gorman Rupp Centrifugal Pump with Model HA2*

Model SL3

*12-3/4 HP @ 1800 RPM*




*3" Marlow Diaphragm Pump with Model LD1*



*Portable Paint Sprayer with Quincy Compressor and Model HA2*

Instant starting. Complete air cooling in temperatures from sub-zero to 130°. For details on these and countless other successful applications write us, stating your requirements.

*Distributorships available in some areas*

**LISTER-BLACKSTONE, INC.** 42-32 21st Street, Long Island City 1, N. Y. Tel.: STillwell 6-8202

*In Canada: Canadian Lister-Blackstone, Ltd., 1921 Eglinton Ave. E., Toronto 13, Ont.*

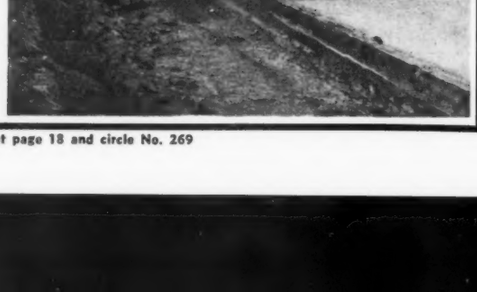
For more facts, use Request Card at page 18 and circle No. 268



*Maintain traffic while laying shoulder material and back-filling*

**POWER-PACK is a multi-purpose machine that gets jobs done fast**

There's no need to stop or delay traffic when you use POWER-PACK for back-filling and shoulder work. Its working width of less than 12' permits you to maintain traffic without slowing down your work. Contractors, state and county highway crews have found POWER-PACK also speeds up jobs and pays for itself in one season. ***Send for complete details now!***



- Conveyor quickly changed for right or left discharge
- Spreads sand, stone or hot mix
- Minimizes manual clean-up
- Requires only one operator
- Frees larger equipment for other work

**POWER-PACK CONVEYOR CO.**

836 E. 140th St. - GLenville 1-7670 - CLEVELAND 10, OHIO

For more facts, use Request Card at page 18 and circle No. 269


## Hyster engineering and division changes

Five personnel changes have been made in the engineering department of Hyster Co., Portland, Ore. H. C. Harbke has been named assistant supervisor on construction machinery in the Tractor Equipment Division; A. H. Huebner, assistant supervisor on new model design in the Industrial Truck Division; J. R. Aaron, supervisor of the newly created advance design group; Howard Stewart, staff engineer, reporting to the chief engineer on special projects; and R. A. Johnson, general supervisor of the new Engineering Services Division, which deals with technical and engineering records and information.

The firm's Peoria, Ill., personnel manager, Paul Hinds, has been named assistant manager of the Tractor Equipment Division with headquarters in Peoria. He will have responsibilities in all phases of operations, except the sales activities, in both the Peoria and Kewanee, Ill., plants.

At the same time, Dean Polson has been made manager of the Martin Trailer Division plant at Kewanee. He was controller and purchasing agent of the Martin Machine Co. for six years prior to the merger of that firm with Hyster.

Rex McCormick, former sales manager of Martin Machine Co., has been appointed assistant sales manager of the Tractor Equipment Division. He will headquarter in Kewanee, with the Martin Trailer Division sales activities as his responsibility.

## GE communications to move to Virginia

The General Electric Co. plans to consolidate the operations of the Communication Products Department, now located in four New York cities, in an existing company plant in Lynchburg, Va., which was built in 1956 for the production of rectifier equipment and components. The manufacture of rectifier equipment will be transferred to an existing GE location in Philadelphia.

The Communication Products Department, which makes two-way radios and point-to-point communication equipment, now has headquarter offices in Liverpool, N. Y., and manufacturing facilities in Syracuse, Utica, and Clyde. The move to Lynchburg will take place gradually over a period of several months.

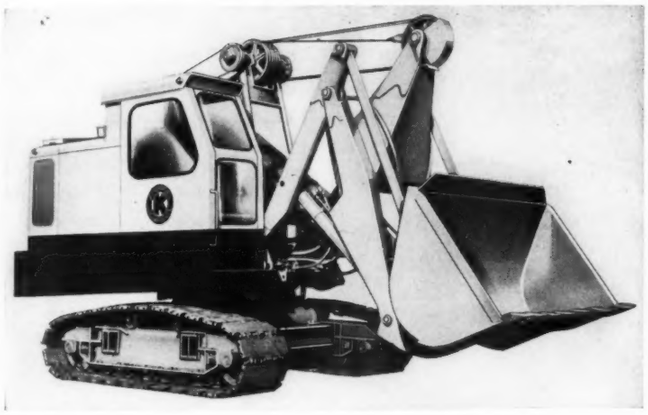
GE's Semiconductor Department at Syracuse will take over some of the space vacated by the Communication Products Department.

## Power-Pack expansion

A new building has been added to the present facilities of Power-Pack Conveyor Co., Cleveland, Ohio. The building provides over 50 per cent more space and includes an equipment display room as well as expanded manufacturing and office area. The firm produces belt conveyors for material handling, and a hopper-conveyor for backfilling trenches and laying road material.

# PRODUCT PARADE

***For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.***



## Loader on tracks permits stand-still digging, loading

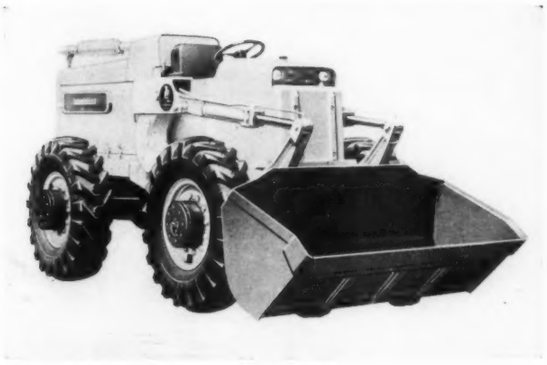
For a new concept in loading, Koehring's diesel-powered Skooper utilizes the fast swing of an excavator turntable and a 7-foot independent crowding action to go through numerous complete loading cycles while standing in one place. The unit, operated with 70 horsepower, can load 400 tph, the manufacturer reports.

Available with buckets ranging from 1⅞ to 2½ cubic yards, the Skooper has a cutting height of 17 feet 4⅝ inches and a 9-foot 8-inch maximum clearance at the end of the dump.

The unit's bucket reportedly cuts evenly up any angle of sloping bank, as well as on an accurate level grade.

Easy change-over to a ½-yard hoe, ¾-yard clamshell or dragline, or a 10-ton lift crane adds to the machine's versatility.

For further information write to the Koehring Co., Dept. C&E, 3026 W. Concordia Ave., Milwaukee 16, Wis., or use the Request Card at page 18. Circle No. 158.



## Rubber-tire tractor shovel offers many improvements

The Frank G. Hough Co. announces a new four-wheel-drive, rubber-tire tractor shovel with 7,000 pounds carrying capacity. Designated Model H-70, the loader is designed to replace the Model HH Payloader.

New and more powerful gasoline and diesel engines provide from 105 to 110 horsepower, the manufacturer reports.

Improved weight distribution provides an additional 1,500 pounds of weight on the rear wheels.

The new, larger torque converter is a single-stage, two-phase unit with a torque-multiplication factor of 2.72:1 at stall. The Paylomatic powershift transmission provides three speeds in each direction.

For further information write to The Frank G. Hough Co., Dept. C&E, 762 Seventh Ave., Libertyville, Ill., or use the Request Card at page 18. Circle No. 157.

## New four-axle truck crane offers a capacity of 50 tons

Available from the Construction Equipment Division of Baldwin-Lima-Hamilton Corp. is a new four-axle 50-ton-capacity truck crane known as the Type 64-T.

The carrier is available in 8×4 and 8×6 drives, and features the use of T1 steel in the main frame and frame components.

Other features include easily removable pin-on-type front and rear outrigger boxes; roller-mounted outrigger beams; full-length combination deck-fender design; large full-vision operator's cab; and full-frame-width engine compartment. Ease of steering is accomplished through hydraulic power on all four front wheels.

The rotating assembly is of compact heavy-duty design, and air control governs all motions. Power is supplied by either a gasoline or diesel engine with torque converter.

For further information about this machine write to the Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Dept. C&E, Lima, Ohio, or use the Request Card at page 18. Circle No. 80.

While the plow is in use, the 10-cubic-foot bucket can be filled with ballast or sand for spreading on icy areas.

## New snowplow offered for powered wheelbarrow

The Prime-Mover Co. offers a snowplow for use with its Model 15A ¾-ton powered wheelbarrow.

New features include correct moldboard curvature and angle for rolling snow off to the side; lateral grooves in the moldboard to prevent snow from packing; relocation of connecting arms to minimize side thrust; and a removable and reversible cutting edge.

The 50-inch blade is easily installed and removed, and, while it is in use, the 10-cubic-foot bucket can be filled with ballast or sand for spreading on icy areas. Blade attachment, bucket, and flat-beds are quickly interchangeable.

The manufacturer claims the plow performs equally well on wet or dry snow.

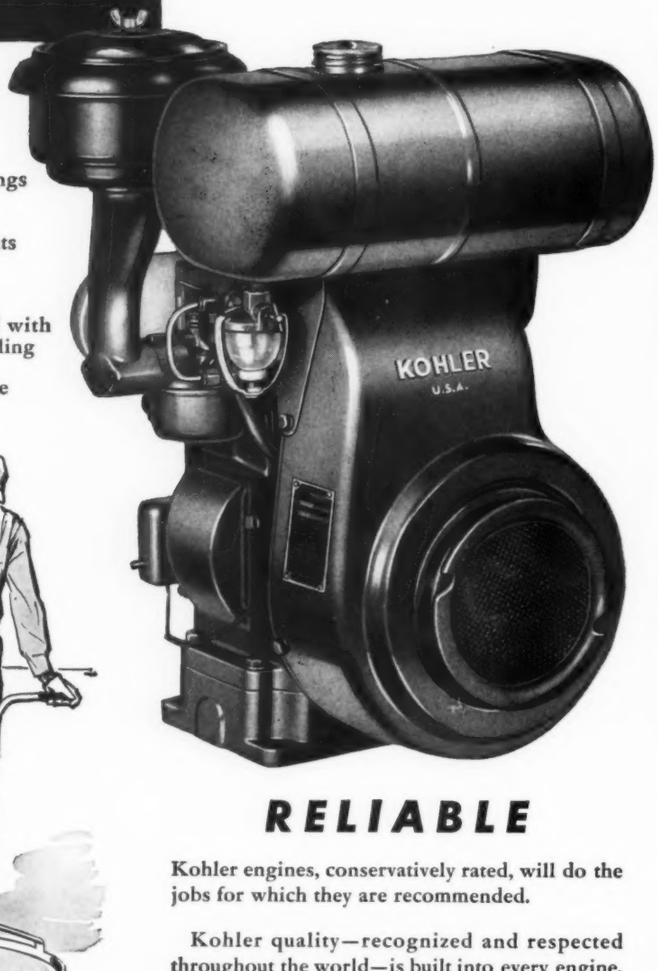
For further information write to The Prime-Mover Co., Dept. C&E, Highway 61E, Muscatine, Iowa, or use the Request Card at page 18. Circle No. 85.


KOHLER ENGINES

4-CYCLE
SHORT-STROKE
AIR-COOLED

MODEL
K160

- Balanced crankshaft—ball bearings at both ends
- Externally mounted breaker points
- Positive splash lubrication
- Aluminum alloy cylinder head with deep fins spaced for efficient cooling
- Mechanical governor for accurate R.P.M. control



RELIABLE

Kohler engines, conservatively rated, will do the jobs for which they are recommended.

Kohler quality—recognized and respected throughout the world—is built into every engine.

FROM 3 TO 24 H. P.

*Send for 28-page illustrated booklet*

KOHLER CO. Established 1873 KOHLER, WIS.

KOHLER OF KOHLER

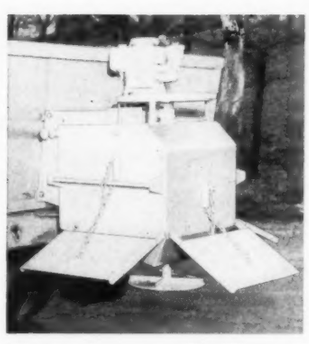
Enameled Iron and Vitreous China Plumbing Fixtures • Brass Fittings • Electric Plants • Air-cooled Engines • Precision Controls

For more facts, use Request Card at page 18 and circle No. 270


## Announce new centrifugal cinder and salt spreader

A new centrifugal cinder and salt spreader for highway use is announced by Voich Bros.

This belt-driven unit reportedly has no gears or sprockets to wear out, and is powered by a Briggs & Stratton 4-cycle gasoline engine. Installation is accomplished quickly by attaching the spreader to the truck tail gate with four bolts.



With no gears or sprockets to wear out, periodic greasing is the only required maintenance on the Voich cinder and salt spreader.

Cinders or salt is fed from the truck body into the spreader through a door in the tail gate. From there the material is evenly spread by the spinning action of the distributing disk. Adjustable deflectors and the speed of the distributing disk control the area of spread.

Since the unit is self-aligning, it remains in a level position regardless of the degree of elevation of the truck body, according to the manufacturer.

The Voich spreader weighs 180 pounds and measures 28×27×40 inches.

For further information write to the Voich Bros., Dept. C&E, R. D. 3, Irwin, Pa., or use the Request Card at page 18. Circle No. 14.

## Backhoe, tractor shovel combination for tractor

The Henry Mfg. Co.'s Mark II backhoe and the firm's new Model 710 tractor shovel are offered as a combination for mounting to the Allis-Chalmers D-17 tractor.

One important feature of the 710

Both the Mark II backhoe and the Model 710 tractor shovel feature quick mounting and detaching, with the Allis-Chalmers D-17 tractor.

is the self-leveling bucket. In addition, a bucket position indicator tells the operator at all times where the bucket is positioned. The unit has a bucket roll-back of 30 degrees with a maximum dump angle of 58 degrees. It lifts a capacity of 2,000 pounds to a loading height of 8 feet 6 inches.

The Mark II backhoe digs to a depth of 12 feet 6 inches, has a loading height of 8 feet 6 inches, and has a reach from the center line of the rear axle of 18 feet 8 inches. It also features a 200-degree arc of continuous swing.

For further information write to the Henry Mfg. Co., Dept. C&E, Box 521, Topeka, Kans., or use the Request Card at page 18. Circle No. 48.

## Lightweight testing unit measures density volumes

The Series 200 Volumeter, a device for the quick and accurate determination of test-hole volumes up to 0.14 cubic feet and in diameters of 3 to 9 inches, is available from the Rainhart Co.

Said to be accurate within ½ of 1 per cent, the sturdily constructed unit weighs less than 30 pounds when filled for operation. According to the manufacturer, it can be operated by semiskilled personnel.

General specifications include a height of 17 inches, 10½-inch-OD base, and a 9-inch-square top.

For further information write to the Rainhart Co., Dept. C&E, P. O. Box 4065, Austin 51, Texas, or use the Request Card at page 18. Circle No. 98.

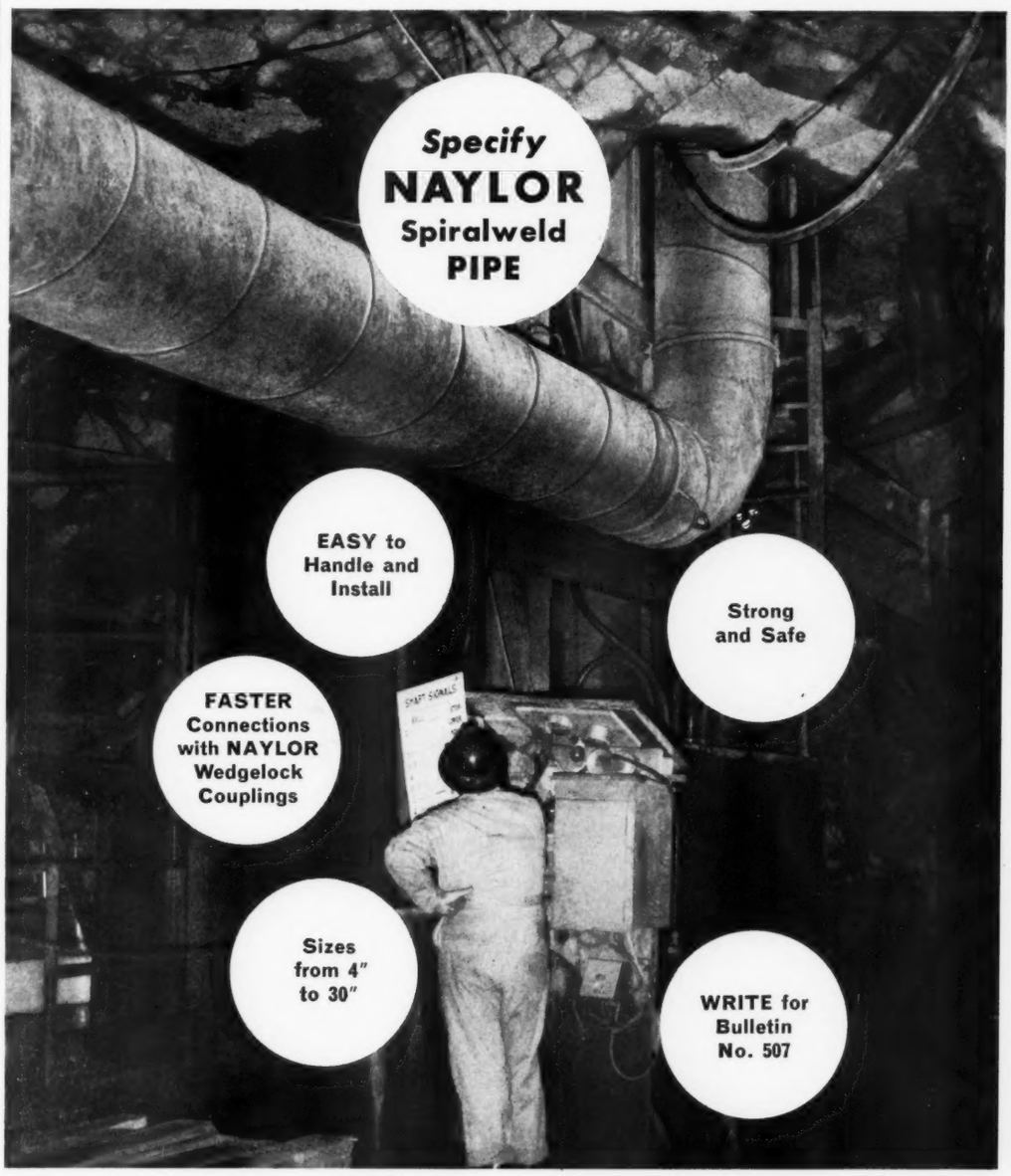
## Improved snowplow wax needs fewer applications

An improved grade of Snow-Rem snowplow wax, said to give up to 20 per cent longer mileage between applications, is announced by Speco, Inc.

Made with a high carnauba wax and silicone content, plus special nonfreezing, fast-acting, quick-drying vehicles, Snow-Rem can be brushed or sprayed on outside in any winter weather.

By coating snowplow blades, moldboards, and wings with Snow-Rem, the manufacturer states, plowing can be increased by at least one-third. In addition, since snow slides rapidly off the waxed surface, piling up of snow on equipment is prevented and substantial engine fuel savings are achieved.

For further information write to Speco, Inc., Dept. C&E, 7308 Associate Ave., Cleveland 9, Ohio, or use the card at page 18. Circle No. 4.


NAYLOR PIPE Company

1270 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

For more facts, use Request Card at page 18 and circle No. 271

**A novel drainage-system construction method,** using American-Marietta Hi-Hed reinforced-concrete pipe, won out over rugged terrain and 48 below zero temperatures on a job at Edmonton, Alberta, Canada. As the Hi-Hed pipe was positioned, rails were extended on its crown, and a hopper car was used to transport the backfill, permitting the contracting firm of Brabant Concrete Products, Ltd., to install the pipe in a 40-foot cut with a minimum of excavation. For further information about Hi-Hed pipe, write to the **American-Marietta Co.,** Concrete Products Division, Dept. C&E, 101 E. Ontario St., Chicago 11, Ill., or use the Request Card at page 18. Circle No. 142.

## Quick snap coupling for all snowplows

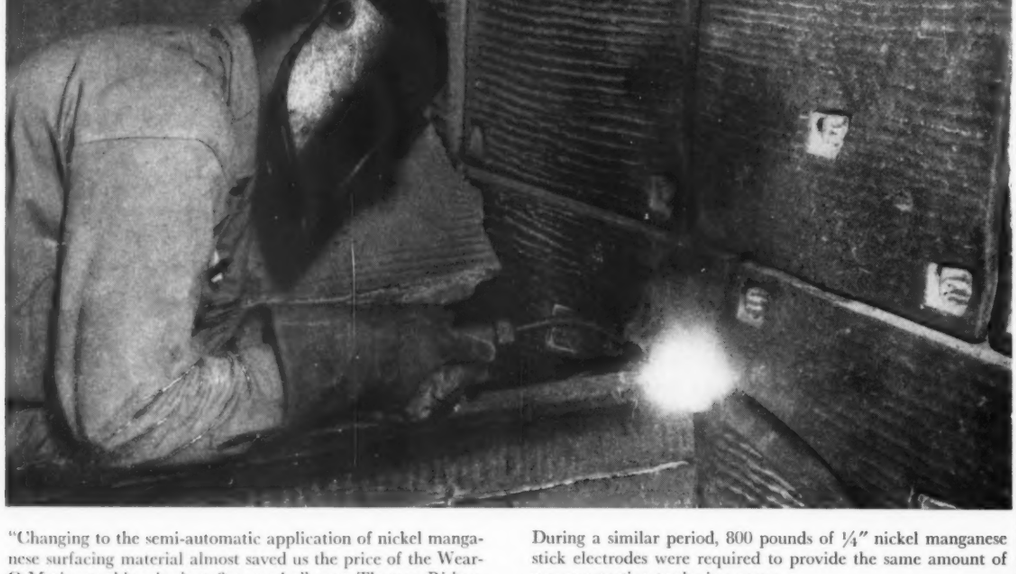
The Forage Master Mfg. Co. announces a new snap coupling for snowplows. The coupling incorporates a Husting hitch, and is said to enable one man to snap-couple a snowplow and truck in three seconds without leaving the cab.

The manufacturer states that the universal coupling permits any truck to be used with any plow. Spring-loaded pins snap into slots when the truck is driven up to the plow. The left arm is automatically in position to lift and carry the plow without the use of auxiliary chains, and uses a standard 10-inch hydraulic cylinder. A single handle withdraws the pins for easy uncoupling.

Lateral plow motion also permits moving the blade up and down, with the blade parallel to the road.

For further information write to the Forage Master Mfg. Co., Dept. C&E, Allenton, Wis., or use the Request Card at page 18. Circle No. 17.


# How semi-automatic hard surfacing saves time and material at Bradford Hills Quarry



"Changing to the semi-automatic application of nickel manganese surfacing material almost saved us the price of the Wear-O-Matic machine in just five weeks," says Thomas Risbon, Welding Foreman for Bradford Hills Quarry, East Petersburg, and Downingtown, Pa.

The Wear-O-Matic unit at Bradford Hills Quarry is used almost exclusively for maintaining their new 57-60 Universal Impactor. Over a five week period, nightly maintenance on this crusher required 500 pounds of 7/64" Wear-O-Matic nickel manganese wire to provide normal operating tolerances.

During a similar period, 800 pounds of ¼" nickel manganese stick electrodes were required to provide the same amount of wear protection to the impactors.

Savings in maintenance operations in your industry are important because they affect profits. Find out how the Wear-O-Matic process can help lighten your maintenance load. It's built right and priced right* to provide for you the most efficient maintenance on all equipment subject to wear. Request Bulletin HS-123 Alloy Rods Company, P. O. Box 1828, York, Pennsylvania.

From this platform on the crusher, the Wear-O-Matic unit is used nightly to maintain proper impactor size for most efficient operation.

Welder Gene Johnson says, "It's easy to turn out square edged impactors like this with the Wear-O-Matic process and, it's less tiring than stick electrodes."

* Price f.o.b. York, Penna. $279.00.

QUALITY WELDING ELECTRODES FOR
Stainless Steel
Mild & Low Alloy Steels
Cast Iron
Tool Steel
Bronzes & Dissimilar Metals
Hard Surfacing Electrodes & Wires

**Alloy Rods Company**

YORK, PENNSYLVANIA • EL SEGUNDO, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 272

Starting a cold engine without SPRAY STARTING FLUID is costly. Constant wear of the starting system . . . wasted man hours . . . equipment down-time . . . repeated engine strain, can be prevented with a pressurized can of SPRAY STARTING FLUID. It's so easy to use! Apply SPRAY STARTING FLUID into the air cleaner or intake air stream while cranking the engine. Continue spraying until the engine runs smoothly. Use SPRAY STARTING FLUID regularly for quick, easy and economical starting of diesel and gasoline engines. Start every work day with SPRAY!

*Until the engine reaches normal operating temperature it is a cold engine.

**SPRAY PRODUCTS CORPORATION**
P. O. Box 844 • Camden 1, New Jersey

For more facts, circle No. 273

Designed for several models of Clark's Michigan equipment, the all-welded-steel cab can be installed easily in the field.

## Offer all-weather cabs for loaders, dozers

The Construction Machinery Division of Clark Equipment Co. offers a full line of all-weather cabs for Michigan 1¼ to 6-cubic-yard tractor shovels and 162 to 600-hp tractor-dozers.

The heavy-duty all-welded-steel cab can be installed easily in the field. All windows are made of safety glass, set in rubber molding. The rear window is hinged for opening and can be completely removed. Simply by removing one cap screw, the operator can take off the door completely for summertime use.

The inside of the cab is sprayed with "muffle-coat" compound to deaden noise.

For further information write to the Construction Machinery Division, Clark Equipment Co., Dept. C&E, Pipestone Road, Benton Harbor, Mich., or use the Request Card at page 18. Circle No. 8.

## Adding machine multiplies and prints the results

A 10-key adding machine designed for automatic multiplication is announced by the Monroe Calculating Machine Co. The Model 111V116 also performs addition, subtraction, and listing, and prints the results on tape.

The machine is said to short-cut

multiplication, saving as much as 25 per cent in cycling time. It performs negative multiplication as easily and rapidly as regular multiplication. All minus amounts and decreases are printed in red, and all increases in black.

Multiplication requires only the manipulation of two extra keys. The machine lists 11 and totals 12, both positive and negative. Multiplying capacity is 99,999×999,999.

For further information write to the Monroe Calculating Machine Co., Inc., Dept. C&E, 555 Mitchell St., Orange, N. J., or use the Request Card at page 18. Circle No. 75.

## Angle gage saves time in bending pipe, conduit

The No. 1802 angle bending gage, designed to save time when bending pipe and conduit, is offered by the Greenlee Tool Co.

A special notched protractor design allows the exact degree of bend to be locked in. Each gage has informative bending data plus a handy rule.

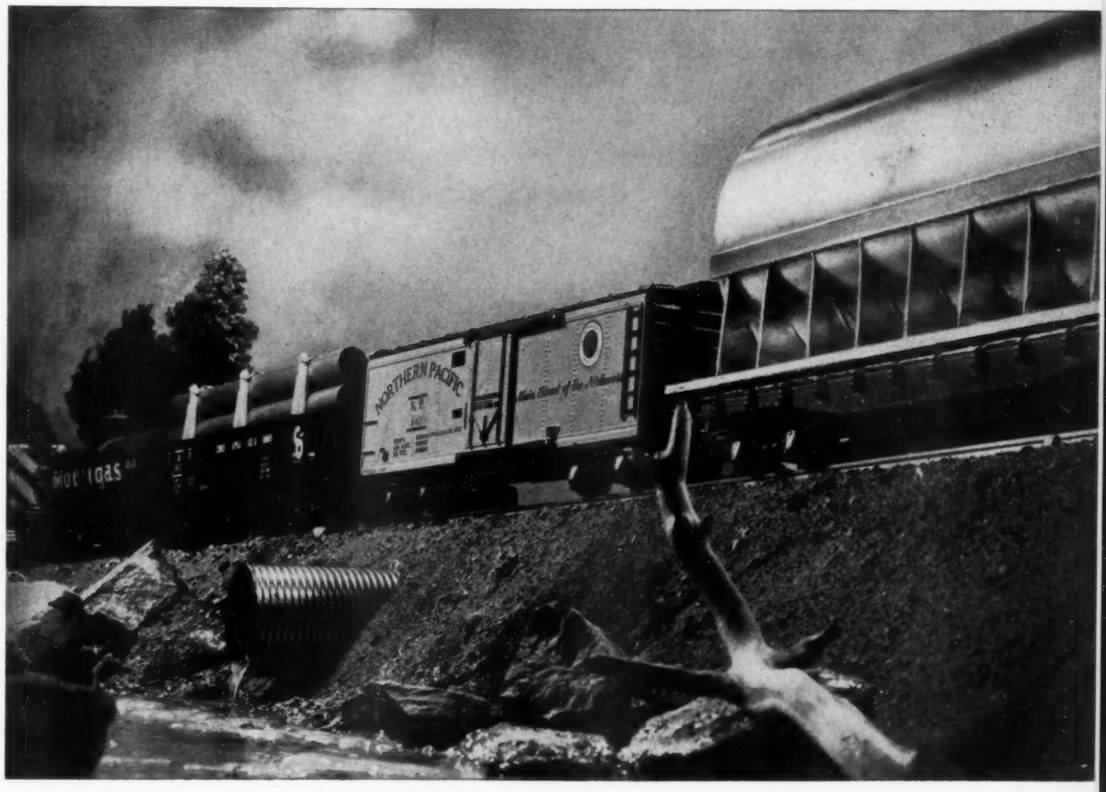
Made of zinc-plated steel, the gage has an over-all length of 70½ inches.

For further information write to the Greenlee Tool Co., Dept. C&E, 2136 12th St., Rockford, Ill., or use the Request Card at page 18. Circle No. 40.


# Want a strong drainage structure?

use Corrugated Metal

**Corrugated Metal** Drainage Structures are *flexible*. A flexible structure deflects under load and gains support from the "passive resistance" of the compressed soil around its sides. That's why it can stand the crushing weight of deep fill and the vibration and impact of heavy loads over shallow fill. Metal drainage products, excellent in all applications, are particularly suitable when the height of earth cover is shallow, or more than 25 feet—in fact, some specifying agencies *require* metal structures under these conditions.




**Write for our free booklet** "USS Culvert Sheets" which tells you how to get the kind of service you can expect from Metal Drainage Structures made from USS Galvanized Culvert Sheets. It's loaded with information about selection of correct structure sizes, preparing foundations and installation procedure. For your free copy, write to United States Steel Corporation, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

*USS is a registered trademark*

USS

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

**United States Steel**

For more facts, use Request Card at page 18 and circle No. 274

The Atlas Copco Tiger rock drill, equipped with an integral-type pusher leg incorporating a retractable piston rod, has fingertip controls mounted on the backhead.

## High-speed rock drill for drifting, tunneling

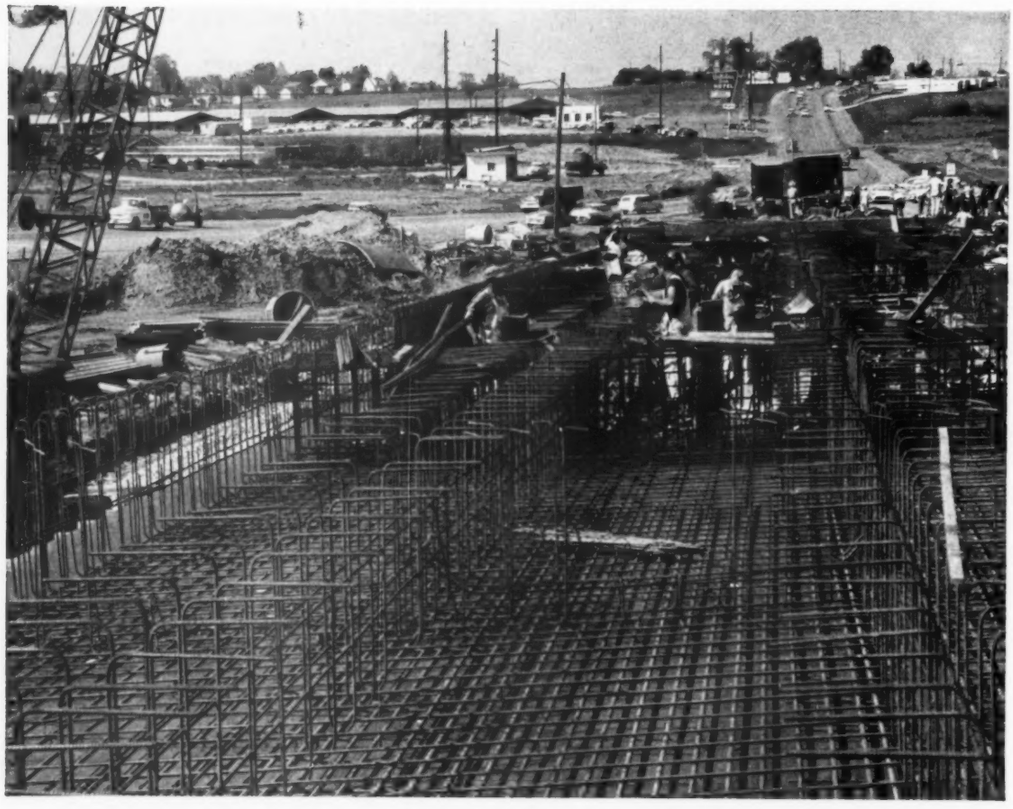
A high-speed rock drill, said to be particularly suited to drifting and tunneling operations, is announced by Atlas Copco.

Called the Tiger, the 60-pound unit is equipped with an integral-type pusher leg incorporating a retractable piston rod. Designed for holes up to 18 feet or more in depth, the drill reportedly can average nearly 20 inches per minute in granite at standard operating pressures.

Other features include an automatic control that begins flushing as soon as the throttle is opened.

A single air supply powers both the Tiger and its matched Atlas Copco BMT 50 pusher, which is connected to the drill by a spring-loaded swivel elbow. The new drill draws 124 cfm at 85 psi, and is designed for feed from a ¾-inch air line and a ½-inch water hose.

For further information write to Atlas Copco Eastern, Dept. C&E, 610 Industrial Ave., Paramus, N. J., or use the Request Card at page 18. Circle No. 87.

LACLEDE HIGH QUALITY REINFORCING STEELS ADD MUSCLE TO NEW EXPRESSWAY BRIDGE

This new highway 40 overpass over the Mark Twain Expressway is an integral part of a road building program designed to speed traffic through suburban St. Louis.

As in many road building projects, Laclede high strength reinforcing steels fortify this bridge for heavy traffic—assuring durability and strength.

***Use these Laclede highway steels to put muscle in your construction projects:***

Welded wire fabric
Welded dowel spacers
Prestressed strand
Multi-rib round reinforcing bars
Center joints
Recess joints
Tie bars
Accessories

*General Contractor: Fruin-Colnon Contracting Company, St. Louis*

LACLEDE®

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

For more facts, use Request Card at page 18 and circle No. 275


## New material handler rated at 1,600 pounds

A material-handling machine with a 9½-foot forward reach ahead of the tires is available from the Lull Engineering Co.

Designated Hi-Lift Model 55, the unit features a built-in transverse action that extends the load hydraulically, affords minimum over-all transport length, and increases maximum lift height.

According to the company, the Model 55 is conservatively rated at 1,600 pounds capacity, and is stable at heights up to 22½ feet.

Available attachments reportedly adapt the unit to any material or type of stacking.

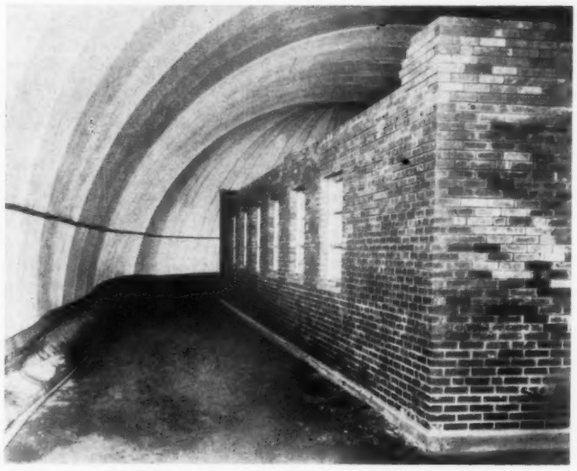
For further information write to the Lull Engineering Co., Dept. C&E, 3045 Highway 13, St. Paul, Minn., or use the Request Card at page 18. Circle No. 137.

## Pneumatic-air-tool noise cut with exhaust muffler

An exhaust muffler said to substantially reduce noise from pneumatic air devices is announced by the Emco Pneumatic Corp.

Designated Silent Air, the unit features corrosion-resistant metals and replaceable muffler cartridges. Installation is quick and easy, according to the company.

For further information write to the Emco Pneumatic Corp., Dept. C&E, 1317–1319 Locust St., Des Moines 9, Iowa, or use the Request Card at page 18. Circle No. 53.



**Because of sub-zero weather, the concrete foundation work had been halted** on the heat-treat pump house of a Ford Motor Co. plant under construction near Cincinnati. This building had to be completed, because the erection of the rest of the plant depended on it. The contractor for the job, Darin & Armstrong, Inc., of Detroit, purchased and erected (in one hour) a Hoosier vinyl-coated translucent nylon air structure over the job site, and work resumed to completion. The structure is designed to be held aloft, firm and taut, by a low-pressure air blower; it easily resists high winds, and will support a tremendous weight of snow, according to the company. The structure for this job was 20 feet high, with 40×100 feet of ground measurements. For further information about Hoosier air structures, write to the **Hoosier Tarpaulin & Canvas Goods Co.**, Dept. C&E, 1302 W. Washington St., Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 28.

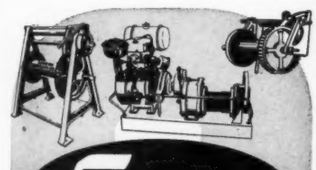
## Multigraded engine oil aids fleet maintenance

Delvac Special, an SAE 10W-30 heavy-duty engine oil for both gasoline and diesel engines on a wide variety of construction machinery, is announced by the Socony Mobil Oil Co., Inc.

The company points out that the oil is of special benefit to mixed-vehicle fleets, in that it simplifies storage and application problems, and its SAE range span permits its use the year around.

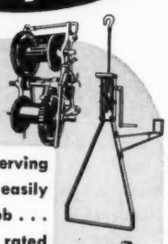
The oil's low viscosity at low temperatures assures easy starting even in the coldest weather, as well as rapid engine warm-up, according to the manufacturer. It also protects against the undue build-up of combustion-chamber deposits.

For further information write to the Socony Mobil Oil Co., Inc., Dept. C&E, 150 E. 42nd St., New York 17, N. Y., or use the Request Card that is bound in at page 18 of this issue. Circle No. 114.

Sasgen

Derricks
Hoists
Winches



Over 50 years serving contractors . . . easily rigged on the job . . . conservatively rated for safety . . . simple in design . . . low-cost maintenance.

See your dealer . . . or write for latest catalog.

Sasgen DERRICK COMPANY
3127 W. GRAND AVE., CHICAGO 22, ILLINOIS
For more facts, circle No. 276

"G-E two-way radio lets me travel between jobs

and direct my men at the same time..."

says Milford Redman, Gen. Supt., Villa Contracting Company, Inc. of Westfield, N. J.

"When I'm approaching the job in the morning, I can start getting reports and issuing instructions even before I arrive," adds Mr. Redman. On its heavy excavating and road-building jobs, Villa uses General Electric two-way radio to keep things moving on schedule, get the most out of men and machines, and co-ordinate with suppliers such as transit-mix concrete.

Whether you're working on one job or twenty, General Electric two-way radio helps put the right equipment at the right spot at the right time—with minimum confusion and delay. No piece of mobile equipment or work crew is ever farther away than the G-E microphone in your car or on your desk.

General Electric's Progress Line is built to take plenty of punishment . . . with transistorized power supplies . . . pre-tested tubes to withstand shock and vibration . . . interchangeable plug-in chassis for faster servicing. Authorized G-E service is available everywhere in the U. S.

Find out how General Electric two-way radio can increase your profits on every job. Call a G-E communications consultant, listed under "Radio Communication Equipment" in the Yellow Pages. Or write to General Electric Company, Communications Products Dept., Section 3010B, Syracuse, N. Y.

GENERAL ELECTRIC

Communications Products Department, Syracuse, New York

For more facts, use Request Card at page 18 and circle No. 277

**Digging speeds up to 3 fpm in 7½-foot-deep Canadian frost** were reported for the Barber-Greene Model 774 wheel-type ditcher. The contracting firm of G. M. Gest Construction Ltd., of Toronto, employs the machine year round in digging pipeline trenches for the gas distribution network in Winnipeg, Manitoba. The trenches average 22 inches wide, and from 3 to 5 feet in depth. For further information write to the **Barber-Greene Co.**, Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 119.


*Roebling Presents*

**THE NEWEST CONCEPT IN WIRE ROPE**

*Herringbone**

*two ropes in one!*

Here is a combination that has proved itself during three years of field testing. A welcome addition to Roebling's great line of wire ropes, Royal Blue *Herringbone* is both a regular lay and lang lay wire rope!

So, in one rope you have the greater flexibility and abrasion resistance of lang lay construction *plus* regular lay's superior stability under severe operating conditions.

Preformed Herringbone is made of two *pairs* of lang lay strands, and two strands of regular lay which separate the two pairs of lang lay—all of it made of Type 1105 rope wire.

For three years Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. Without reservation, its performance has been superior to that of any other rope used for the same jobs . . . even in the hands of inexperienced personnel! *Its proven capabilities clearly suggest its use for all jobs where steel core ropes are normally used.*

See your Roebling salesman for all the facts or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey. Roebling Herringbone, the two-in-one rope to meet the *doubly* stringent demands of today's economy.

ROEBLING

*Branch Offices in Principal Cities*

*Subsidiary of The Colorado Fuel and Iron Corporation*

**Reg. app. for*

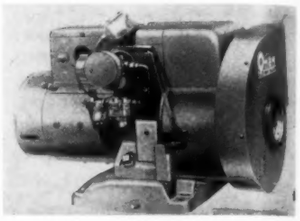
HERRINGBONE WIRE ROPE

**For more facts, use Request Card at page 18 and circle No. 278**


## Two new combination ac-dc generating plants

Two new gasoline-driven electric generating plants, in 1-kw and 2-kw sizes, each with a 30-amp regulated 12-volt dc battery-charging circuit, are announced by D. W. Onan & Sons, Inc. They are known as Model 1AJ-1RV1330 and Model 2LK-1RV1330, respectively.

Though the units are designed specifically for charging batteries on work trucks or other vehicles which have a high current drain imposed by lights and communications equipment, they can also be used for the operation of electric tools and floodlights.



Each model is powered by an Onan single-cylinder 1,800-rpm 4-cycle engine direct-connected to an Onan-built generator. Both are completely self-contained, with remote starting controlled from the plant, the truck-cab instrument panel, or any other convenient spot on the vehicle.

For further information write to D. W. Onan & Sons, Inc., Dept. C&E, 2515 University Ave. S. E., Minneapolis, Minn., or use the Request Card at page 18. Circle No. 76.

## Compactor power float has new dial control

The Kelley Machine Division of the Wiesner-Rapp Co., Inc., announces several new features in the redesigned Kelley compactor power float. According to the company, the machine is larger, more powerful, easier to operate, and now has "compaction control", which is achieved by setting a convenient dial to any one of four degrees of compaction.

The unit is used for compaction-floating all types of concrete floors, for keying-in touch surface hardener materials, and for bonding dry-tamp topping to a base slab.

For further information write to the Kelley Machine Division, Wiesner-Rapp Co., Inc., Dept. C&E, 283 Hinman Ave., Buffalo 23, N. Y., or use the Request Card at page 18. Circle No. 105.

**This mobile field office features 512 cubic feet of space,** and is said to be maintenance-free, as well as fire and theftproof. The undercarriage can be removed in minutes, and the office, when securely anchored, will withstand winds up to 100 mph and an unlimited snow load. The unit is available in knock-down kit form or fully assembled, wired, and painted. For further information write to the **Burlington Mfg., Co.**, Dept. C&E, 613 S. Roosevelt Ave., Burlington, Iowa, or use the Request Card at page 18. Circle No. 91.

*To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.*

### Announce lightweight cabs for earthmoving units

Molded Fiberglas-polyester cabs, that weigh only 70 pounds, are offered by Peterson Products for many different types of earthmoving equipment and rigs.

The cabs are said to decrease dead load, as well as eliminate rusting, rattling, and denting. Also, the manufacturer reports, the units are sound-absorbing, and stay cool in the summer and warm in the winter.

The cabs are of one-piece molded construction, with green-tinted rear and top Plexiglas panels and a wrap-around rear window. Installation is said to be simple, and can be handled by one man.

For further information write to Peterson Products, Dept. C&E, 1751 Leslie St., San Mateo, Calif., or use the Request Card at page 18. Circle No. 126.


CONCRETE TESTERS

*The World's Finest Low-Cost Precision Testers*

For

CYLINDERS
CUBES
BLOCKS
BEAMS
PIPE

IF IT'S A CONCRETE TESTER YOU NEED-GET IN TOUCH WITH

FORNEY'S, Inc.
TESTER DIVISION
P.O. BOX 310 · NEW CASTLE, PA.

For more facts, circle No. 279



HOW MUCH PROFIT IN THIS BUCKET?

Here's profit staring you right in the face . . . the heaped bucket of a Trojan tractor shovel . . . But it's the machine behind the bucket that *keeps* profits at their highest peak . . . All five Trojan models, from 18 cu. ft. to 4 cu. yds., are packed with a tremendous production potential, packed with longer working life and with features that keep maintenance at a bare minimum . . . Trojan operating features include low-load carrying position, reverse curve safety arms, straight line horizontal thrust, independent bucket action, non-stop shifting and Detroit Timken high traction differential and planetary axles . . . No other tractor shovel offers all these operating benefits, and that is why no other tractor shovel can match Trojan! For the name of nearest distributor, who will arrange a demonstration, in the Western area contact Dept. JB at San Leandro, Cal. In the East, contact Dept. RA at Batavia, N. Y.

Complete, detailed brochures are now available on the Trojan line. For your material write to Department C10, Contractors Machinery Div., The Yale & Towne Mfg. Co., Batavia, N. Y. or San Leandro, Cal.

TROJAN* TRACTOR SHOVELS
*REG. U. S. PAT. OFF.
YALE & TOWNE
2 & 4 Wheel Drive Front End Loaders

TROJAN DIVISION, THE YALE & TOWNE MANUFACTURING COMPANY, BATAVIA, NEW YORK, SAN LEANDRO, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 280

Accurately controlled from the operator's platform, the attachment works as a natural, adjustable extension to the moldboard.

## Motor-grader attachment reduces finishing time

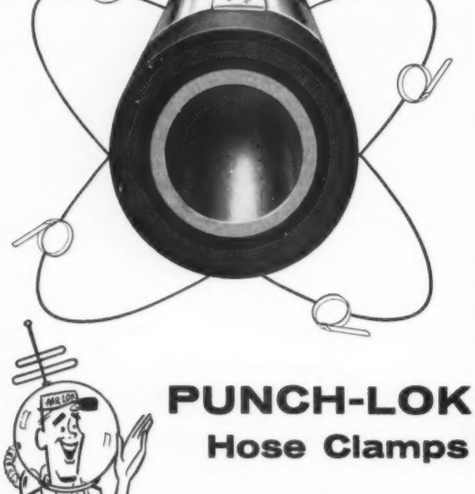
A versatile new motor-grader moldboard attachment, the hydraulically operated Bee-Line finisher, is announced by Hasselbalch & Sons. The unit works as a natural, adjustable extension to the moldboard, and is said to substantially reduce finishing time.

With the Bee-Line angled down, the operator reportedly can brush the top of the grade and strike the shoulder line in one pass, to finest specifications. It also extends moldboard reach for cutting farther up long back slopes. With the unit angled up, one pass of the motor grader cleans excess material from the base of back and fore slopes, and sets the toe line of the slope.

The new finisher is available for all Caterpillar No. 12's back to 9K 2912, as well as for Adams Models 660, 550, 440, and 330.

For further information write to Hasselbalch & Sons, Dept. C&E, 1112 Capital, Omaha, Nebr., or use the Request Card that is bound in at page 18. Circle No. 11.


IN ORBIT
for a LIFETIME!



PUNCH-LOK
Hose Clamps

MR. LOK SAYS:
When a Punch-Lok clamp goes into orbit around a hose connection it's there to stay.

DOC PUNCH SAYS:
Tell the hose user it's a life-saver prescription for outer-space too.

NO SNAG! NO LEAKS!

NEW! from PUNCH-LOK

New K-45 Clamp-Master Kit now in all-steel carrying case finished in red baked-on enamel.

Tension-Air production hose clamping machine with clamp remover Model TA-1.

See your nearby Punch-Lok Distributor 8382

"The Sign of a GOOD Hose Clamp"

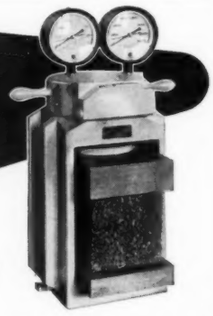
PUNCH-LOK Company

Dept. J, 321 N. Justine Street, Chicago 7, Illinois

For more facts, circle No. 281



NEW PORTABLE



CONCRETE BLOCK & CYLINDER TESTER

- COMPACT—entirely self contained unit.
- ACCURATE—meets ASTM and AASHO specifications.
- EASY TO OPERATE—loads to 200,000 lbs. are developed easily with hand operated hydraulic pump. Motor driven pump is also available.
- LARGE TESTING AREA—for concrete blocks to 9" x 18" and standard 6" and 12" dia. concrete cylinders.
- TWO RANGE CAPACITIES—for complete testing flexibility. Loads are indicated on large, direct reading dials.
- FLEXURE TESTING—attachment available for concrete beams.

*For full information, write today for Bulletin 55.*

TINIUS OLSEN TESTING MACHINE CO.
2130 Easton Road · Willow Grove, Pa.

For more facts, circle No. 282



DE-WATERING PROBLEMS LICKED

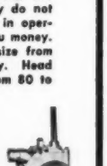
FLYGT ELECTRIC PUMPS

Contractors throughout the world find FLYGT SUBMERSIBLE ELECTRIC PUMPS tops in performance on any de-watering problem. Users such as Bechtel Corp. and Peter Kiewit Son's Co. like FLYGT foolproof features, the advantage that the pumps work in any position, and the fact that they do not clog up. FLYGT PUMPS are low in initial cost, low in operating expense, require little attention . . . save you money.

FLYGT SUBMERSIBLE ELECTRIC PUMPS range in size from 1½"-85 GPM capacity to 8"-3000 GPM capacity. Head capacities range up to 210 feet. Weights range from 80 to 1200 pounds.

CHECK THESE FLYGT FEATURES

- ✓ Electric
- ✓ Resistant to Salt Water
- ✓ Easy to Handle
- ✓ Low Maintenance Costs
- ✓ Submersible
- ✓ Will Pump High Amount of Solids
- ✓ Operates Unattended
- ✓ Runs Dry Without Damage
- ✓ Heavy Duty
- ✓ Quick and Easy to Service
- ✓ No Installation Costs
- ✓ No Priming Needed



WRITE FOR NAME OF YOUR NEAREST DEALER

West of the Mississippi:
STANCO
MFGS. & SALES INC.
1666 Ninth St.
(Cor. of Olympic & Ninth)
Santa Monica, California

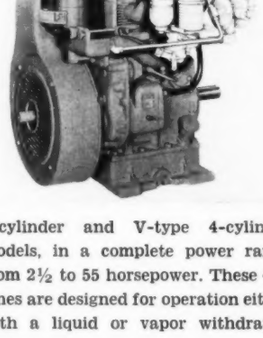
East of the Mississippi:
STENBERG
Mfg. Corporation, Ltd.
Hoosick Falls
New York

For more facts, circle No. 283


## LPG engines added to air-cooled line

The Wisconsin Motor Corp. announces its new LPG line of heavy-duty, air-cooled, 4-cycle engines.

The line includes a full range of sizes from single-cylinder models to



2-cylinder and V-type 4-cylinder models, in a complete power range from 2½ to 55 horsepower. These engines are designed for operation either with a liquid or vapor withdrawal system.

Special conversion kits are also available for converting standard Wisconsin gasoline engines to LPG operation.

For further information write to the Wisconsin Motor Corp., Dept. C&E, 1910 S. 53rd St., Milwaukee 46, Wis., or use the Request Card at page 18. Circle No. 159.

*For more facts on these products, circle the indicated number on the Request Card at page 18.*

## Pipe and cable locator weighs only four pounds

A small-size locator for pipes, cables, and other sub-surface installations is available from the Wilkinson Products Co.

Designated Model W-3, the unit weighs only four pounds. Its features include transistors instead of tubes, a single ear transistor head set, and a connecting handle that telescopes to 17 inches. The handle is carried in the case along with the transmitter and receiver.

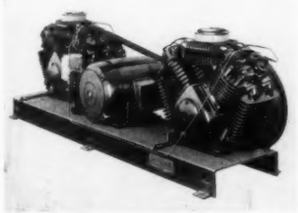
For further information write to the Wilkinson Products Co., Dept. C&E, 3987 Chevy Chase Drive, Pasadena 3, Calif., or use the Request Card at page 18. Circle No. 83.

**Featuring no-turn shuttle hauling,** the new Dumptor Model 100 is designed to climb 28½ per cent grades with its maximum 10-yard, 30,000-pound payload. Dual steering wheels, throttles, brakes, and a pivoting operator's seat are provided. The unit offers speeds up to 20 mph in either direction. Measurement from the ground level to the top of the dump body is 8 feet 3 inches. With the Model 100, both instantaneous gravity and a controlled dump are possible. For further information write to the **Koehring Co.**, Dept. C&E, 3026 W. Concordia Ave., Milwaukee 16, Wis., or use the Request Card at page 18. Circle No. 35.

## Large air compressors for maintenance shops

For operation of air tools in maintenance shops, The DeVilbiss Co. offers new 20 and 25-hp, 125 and 175-pound air compressors.

Double compressor units, they reportedly will displace from 96.4 to 129 feet of air per minute. They are equipped with pressure switch and magnetically controlled unloaders. A magnetic starter with selector switch for automatic start-stop operation or constant speed unloading is available, as are vertical air receivers for remote installation.



The V-type, multiple-cylinder compressors are 88 inches long, 28⅜ inches high, and 28 inches wide. They weigh approximately 1,700 pounds.

For further information write to The DeVilbiss Co., Dept. C&E, 300 Phillips Ave., Toledo 1, Ohio, or use the Request Card at page 18. Circle No. 120.

## Portable photocopier offers fast reproduction

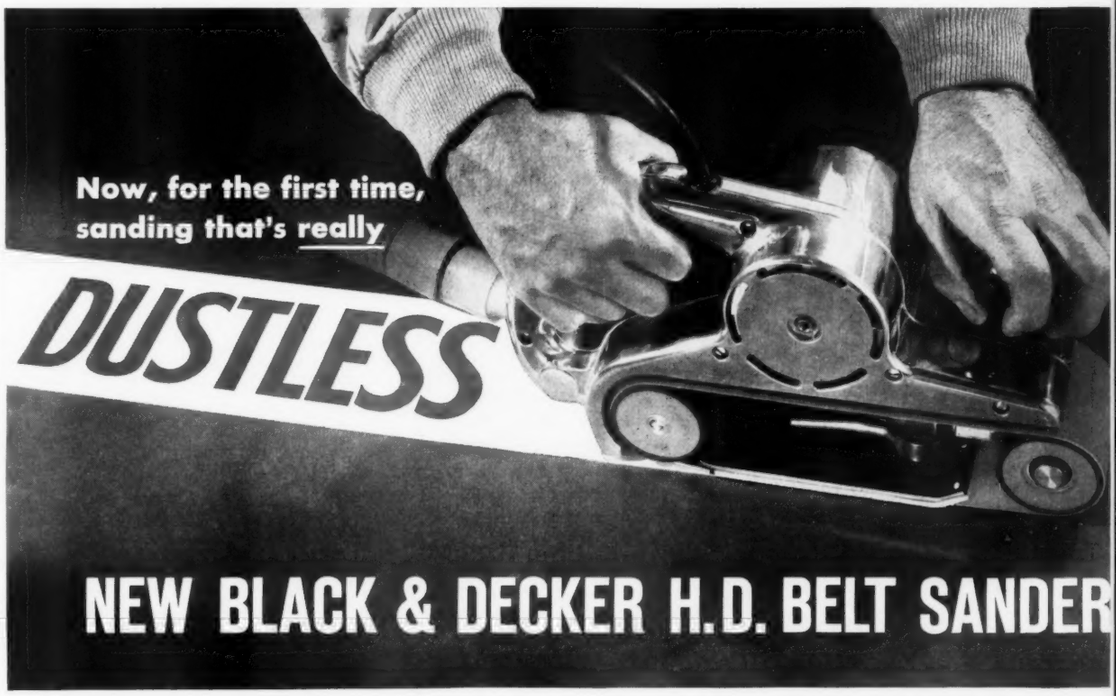
A lightweight, portable office photocopy machine that will reproduce any original office-sized document in approximately 19 seconds is announced by the American Photocopy Equipment Co.

Designated Director Auto-Stat, the machine features single push-button control and continuous automatic feed operation.

The 25-pound unit operates on standard electric power. It measures 11 inches deep, 5½ inches high, and 20½ inches long.

For further information write to the American Photocopy Equipment Co., Dept. C&E, 2100 W. Dempster St., Evanston, Ill., or use the Request Card at page 18. Circle No. 103.

For more facts, use coupon or circle No. 284→

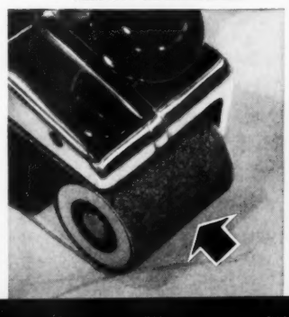

**vacuums dust for faster work . . . longer belt life!**

**GREASELESS, SPOTLESS WORK:** Exclusive B&D gearless transmission requires no lubrication, hence no grease to spot working surface!

**WORK TIGHT SPOTS:** Flush side permits working on vertical surfaces. Exclusive front belt pulley lets you work on curved surfaces and small radii.

**QUICK BELT CHANGING:** Just flip the lever; slide old belt off, new belt on. With B&D's exclusive dustless operation, belts last longer, too!

**3 MODELS** allow you to select exactly the tool that suits your needs. Your distributor will gladly demonstrate all three on your work.



You get unique vacuum hook-up plus many outstanding features!

Whether you work in wood, plastic, glass, steel or any metal, here's a Belt Sander you'll see and want! Only Black & Decker's 3″ Heavy-Duty Belt Sander offers you *true* dustless sanding with a vacuum system that whisks away bothersome dust as fast as it forms! And, the cost is lower than you'd think.

Check the features at left, then mail coupon for a free demonstration. Three models to choose from—and once you've seen it in operation you'll want it for your production or maintenance.

Leading Distributors Everywhere Sell

Look Under "TOOLS-ELECTRIC" in Yellow Pages

Black & Decker®

Quality Electric Tools . . . Power-built to set the pace

MAIL TODAY FOR FREE DEMONSTRATION

THE BLACK & DECKER MFG. CO., Dept. 1310, Towson 4, Md.
(In Canada: Brockville, Ontario)

☐ Please arrange a free demonstration of your new Belt Sander.

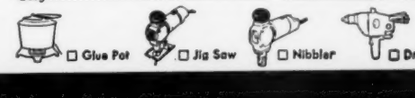
☐ Send me more information.

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....



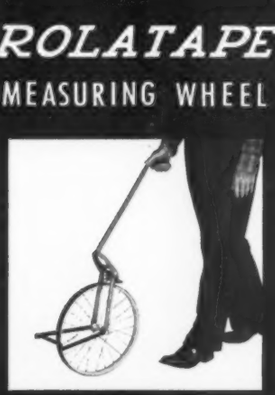
**On a drainage ditch relocation job,** a Schield Bantam Model C-35 crawler-dragline, owned and operated by Heckaman Excavating & Drainage, Bremen, Ind., cut an average of 500 feet of 5 to 6-foot trench per day through a 6-inch frost layer. The job called for a total of 1,400 feet of new drainage ditch—V-type, 14 feet across the top, 1 to 1 slope. On the same job, Heckaman used his Bantam to clean approximately 3,800 feet of existing trench of the same size. For further information write to the **Schield Bantam Co.,** Dept. C&E, Waverly, Iowa, or use the card at page 18. Circle No. 123.


for FASTER, more ACCURATE HIGHWAY MEASURING

USE A

ROLATAPE

MEASURING WHEEL



FOR HIGHWAY REPAIR

One man can measure as fast as he normally walks when using the Rolatape 400. Total is automatically recorded in full view of the operator.

HIGHWAY CONSTRUCTION

Rolatape's accuracy and speed are ideal for important measurements connected with estimating, daily progress reports and final inspection.

HIGHWAY MAINTENANCE

Street marking and sign placement require accurate measurements—the degree of accuracy you get with Rolatape's precision 400 wheel.

WRITE TODAY FOR FULL DETAILS

ROLATAPE, INC.

1741 14th ST. SANTA MONICA CALIFORNIA

For more facts, circle No. 285


## Diesel-powered plant offered in three models

Norseman Marine announces a new addition to its line of electric power and light plants.

The ND25 is a diesel-powered unit with a capacity of 25,000 watts. It is available in 120/208-volt, 3-phase, 4-wire; 240-volt, 3-phase, 3-wire; and 120/240-volt, single-phase, 3-wire models.

Generators on all models are 4-poie revolving-field type, with direct-connected exciter.

The 6-cylinder diesel driving unit is rated at 60 horsepower, and has a displacement of 265 cubic inches.

Standard electrical equipment on all models is a 12-volt starting motor, starting switch, generator, and voltage regulator. An automatic voltage regulator for the generator, rheostat, and voltmeter is also furnished.

For further information write to Norseman Marine, Dept. C&E, 1552 Harrison St., Oshkosh, Wis., or use the Request Card at page 18. Circle No. 55.


New SYNTRON

SELF-CONTAINED ELECTRIC

HAMMER DRILLS

Self-Rotating - Take all the work out of drilling in concrete

The new SYNTRON Electric Hammer Drills are now available as single, self-contained units — plug directly into power outlet — only one connection to make — no control box to drag along.

SYNTRON's exclusive, automatic, self-rotation of drill bits takes all the work out of drilling holes in concrete — no more tiresome quarter-turning of bits by hand.

SYNTRON Electric Hammer Drills are noted for their dependability, and long trouble free life — SYNTRON'S fewer working parts means lower maintenance.

For complete information on SYNTRON's new self-contained Electric Hammers and Hammer Drills write to . . .

C758

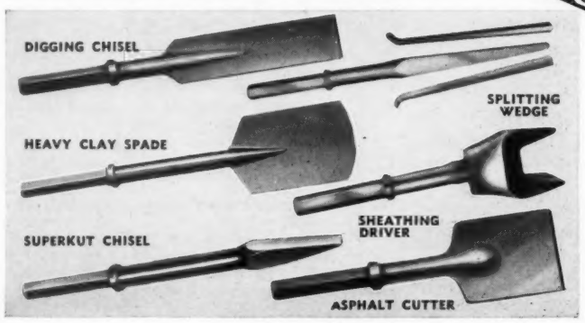
SYNTRON COMPANY

227 Lexington Ave. Homer City, Pa.

For more facts, use Request Card at page 18 and circle No. 286

Specify VULCAN FOR YOUR PAVEMENT BREAKING TOOLS

Quality Made For Your Protection




VULCAN manufactures a complete line of top quality tools for the toughest pavement breaking applications known. VULCAN tools are designed to meet today's construction demands where the use of more powerful hammers requires better tools — where work deadlines must be met — where equipment must be the best.

Not only do Vulcan tools offer absolute dependability and satisfaction at lowest possible cost, but their toughness and unexcelled performance are VULCAN extras that you get at no added cost.

Why not test the rugged strength and durability of VULCAN tools today?

*Specify* **VULCAN** *for:*

PAVEMENT BREAKING TOOLS
CLAY DIGGING TOOLS
DRILL STEELS
PNEUMATIC HAMMER TOOLS
ELECTRIC HAMMER TOOLS
HAND TOOLS FOR CONCRETE, STONE, AND STEEL WORKERS

VULCAN

*VULCAN TOOLS are sold by distributors throughout the United States and Canada.*

VULCAN TOOL MANUFACTURING COMPANY

41 LIBERTY STREET, QUINCY 69, MASSACHUSETTS

*Specialists in the Design and Production of Pneumatic Tool Accessories*

For more facts, use Request Card at page 18 and circle No. 287

## Rear dumper lugs 25 tons at speeds up to 31.2 mph

Curtiss-Wright offers the Model CWD-214 25-ton rear-dump unit, featuring a load capacity of 14 yards struck.

The vehicle is 28 feet 11 inches long, 11 feet 5¾ inches wide, and 11 feet 3⅞ inches in height. According to the manufacturer, the width required for a non-stop 180-degree turn is 37 feet.

Power is supplied by a Cummins Model HRS-6 240-hp, 4-cycle, water-cooled diesel engine. Rated speeds with the dumper loaded are said to range from 3 to 31.2 mph.

The unit's body is a double-bottom, heavy-duty, quarry-type dumper, with a loading height of 9 feet 4 inches. The hydraulic hoist is of 3-stage telescopic cylinder design.

For further information write to Curtiss-Wright Construction Machinery, South Bend Division, Dept. C&E, South Bend, Ind., or use the Request Card at page 18. Circle No. 139.

◄ The CWD-214 features capacities of 14 cubic yards struck or 21 yards heaped (1 to 1 slope). At rated engine speed with loaded dumper, the unit travels at speeds up to 31.2 mph.

*For further information on any product described in this section, circle the indicated number on the Request Card at page 18.*

## Emergency power source works off vehicle engine

A 2,000-watt ac power source is available from Forney Generators, Inc., as a permanent installation on truck, tractor, or car.

The armature is driven from the engine's fan-belt system, and the field is excited by current from the 12-volt or 6-volt battery of the engine, running at fast idle. Included is a service outlet and voltmeter to permit engine operation at proper speed for the output required.

The unit does not add to the power load of the vehicle while driving, and is quickly removed from one engine and installed in another whenever desired.

For further information write to Forney Generators, Inc., Dept. C&E, Fort Collins, Colo., or use the Request Card at page 18. Circle No. 127.


**WARN HUBS**
*on your 4-wheel drive stop front end drag in 2-wheel drive!*

APPROVED Jeep EQUIPMENT

Models for all makes of 4 w. ds. to 1½ tons at dealers. Write for literature.

**NEW ECONOMY!**
**NEW CONVENIENCE!**

Save on repairs, tires, gas... get new pep, handling ease... with Warn Hubs, the original "selective drive." You'll be way ahead with either automatic LOCK-O-MATICS, or fingertip control Warn Locking Hubs. Unconditionally guaranteed.

PROVEN IN OVER A **BILLION MILES** OF USE UNDER ALL CONDITIONS!

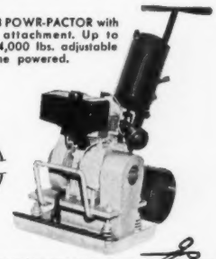
**WARN MANUFACTURING CO., Inc.** Riverton Box 6064-CN10, Seattle 88, Wash.
For more facts, use Request Card at page 18 and circle No. 288

**MAGINNISS**
**POWR-PACTORS**
***patch asphalt faster!***

Maginniss *vibratory* compactors speed placing and patching of blacktop . . . are easily moved from job to job . . . work fast, at speeds up to 50 ft. per minute. Water feed prevents asphalt adhesion . . . assures smooth finish.

Put Maginniss Powr-Pactors to work on your blacktop jobs. The increased production, lower costs and small initial investment will surprise you. Call your Maginniss distributor today! Maginniss Power Tool Company, 154 Distl Avenue, Mansfield, Ohio. AA-7621

MODEL PP-18 POWR-PACTOR with water feed attachment. Up to 7,000 vpm, 4,000 lbs. adjustable force, gasoline powered.



Maginniss POWR PACTOR VIBRATORY COMPACTOR

**Maginniss Power Tool Company**
**154 Distl Ave., Mansfield, Ohio**
Yes, I want to know more about the Powr-Pactor for asphalt work.

name _____
address _____
city _____ zone ____ state ____

For more facts, use coupon or circle No. 290



***Don't Tear Up and Replace Old Asphalt...***

**RECONDITION IT**
**with the NEW Re-Designed**
**Series M-2**
**MONATCO**
**HEATER-PLANER**

**Safely**
This machine won't burn up! Won't set fire to pavement or surroundings! NO SMOKE! Soft reducing flame ends fire hazard. Vital parts of machine are out of heat zone.

**Efficiently**
One pass, with one operator: (1) heats pavement through to base (2000° F. under the Hood)—(2) planes 80" wide, up to 1" deep—(3) leaves raw, clean, level surface, in perfect condition for seal-coating and/or re-surfacing. Use this one machine for maintaining, for repairing, for re-paving preparation.

**Economically**
Actual records show planing costs as low as .10 per square yd.!

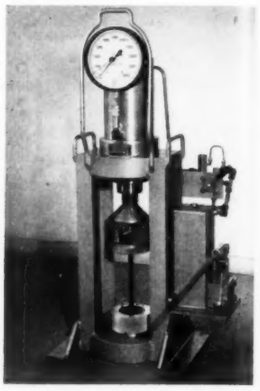
MONATCO developed and built the first Heater-Planer in the United States. M-2 Models, completely re-designed, offer safety, efficiency and economy that cannot be duplicated in any other road-maintaining machine or combination of machines. Protected by U. S. Patent No. 2,705,906 and 2,821,976.

Can be equipped with scarifying teeth, to soften and efficiently remove damaged pavement.

Dealership available in a few areas.

**MONATCO MFG. CORPORATION** *2214 Front St., Kansas City 15, Kans.*
For more facts, use Request Card at page 18 and circle No. 289

**Blast holes from 6⅝ to 9 inches in diameter** can be drilled with the new Robbins Model RR9 rotary drill, which utilizes 20-foot sections of drill pipe. The unit features an air compressor that is direct-driven from the tractor front power takeoff. The tractor engine provides all necessary power for the complete drilling operation. For further information write to **Robbins Machine & Mfg. Co., Inc.**, Dept. C&E, P. O. Box 281, Oneonta, Ala., or use the Request Card at page 18. Circle No. 155.



## Concrete testing machine performs dual function

Compression testing up to 200,000 pounds and reinforcing bar tension testing up to 100,000 pounds are now combined on a new portable machine announced by Soiltest, Inc.

Suited for on-the-job testing and quality control in reinforced-concrete work, the hand-operated machine is entirely self-contained, and requires no pressure or electrical connections. The two load-indicating gages reportedly are calibrated to be accurate within 1 per cent of indicated load.

The machine weighs less than 600 pounds.

For further information write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 160.

## Alumnium flat-bed trailer carries more payload

An aluminum flatbed trailer with a payload capacity of 50,000 pounds is announced by the Williamsen Body & Equipment Co. The 40-foot-long unit weighs only 7,400 pounds.

The trailer is designed to make possible the rapid installation of side walls. Rope or chain tie-downs are interchangeable. Flanged aluminum side extrusions will accommodate a flooring of extruded aluminum, wood, or metal plate, the company states.

For further information write to the Williamsen Body & Equipment Co., Dept. C&E, 933 Wall Ave., Ogden, Utah, or use the Request Card at page 18. Circle No. 62.

## Concrete-curing blanket aids in winter work

The Max Katz Bag Co., Inc., offers its MaKa insulated concrete-curing blanket for the protection of freshly poured concrete in extremely cold weather.

The blanket is made of 1 or 2-inch Fiberglas, and is encased in Visqueen film. It reportedly effects satisfactory curing in near-zero temperatures, with no heat required.

For further information write to the Max Katz Bag Co., Inc., Dept. C&E, 316 S. New Jersey St., Indianapolis 4, Ind., or use the Request Card that is bound in at page 18 of this issue. Circle No. 46.


**Now! NEW ISSUE TRUCKS**
**Bring You HIGH SPEED in 6x6's!**

GMC—MACK
REO "EAGER BEAVER"

**LOW, LOW PRICES! GUARANTEED! TROUBLE-FREE!**
**IN CURRENT OPERATION BY ARMY AND NATIONAL GUARD UNITS!**

• *Complete Parts Stock!* • *Immediate Delivery!*

AT LAST—High Speed combined with power, outstanding performance, rugged get-up-and-go—bring you everything you've been looking for in a truck!

And what a selection! Whatever your job, here's the truck for you. **The rough and ready Mack! The powerful, rugged GMC! The outstanding Reo "Eager Beaver!"** Each model the latest, most advanced truck engineering available today—at prices so low it's hard to believe. All with steel cab kits.

Contact us, too, for the complete line of unused army trucks!

*For specifications, prices, delivery—write, wire or phone collect*

MEMPHIS EQUIPMENT Company
ARMY TRUCKS • PARTS • CONSTRUCTION EQUIPMENT

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For more facts, circle No. 291

**Hammerlok®**
**COUPLING LINK**

**MAKE UP YOUR OWN HERC-ALLOY SLINGS.** No more waiting for new or repaired assemblies to reach you from the factory.

- No peening or welding
- Anybody can assemble
- Stronger than Herc-Alloy chain
- Thoroughly field tested
- Re-useable and SAFE

*Made by the makers of Herc-Alloy, the original alloy steel chain. Write for instruction folder.*

CM HOISTS AND CHAIN

**COLUMBUS McKINNON CHAIN CORP.**
**TONAWANDA, NEW YORK**
Regional Offices:
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*In Canada:* McKinnon Columbus Chain Ltd., St. Catharines, Ont.
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**PRESS**

**TRIPLE TAPERED DUMP BODIES**

Designed primarily for handling sand and gravel, this outstanding Press body features a 3 taper design which allows for greater load on the front end to take advantage of strict weight laws. Available with underbody or front mount hoist. Write today for literature on Press bodies.

**99 YEARS OF QUALITY BODY BUILDING**

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**JACOB PRESS' SONS, inc.**
PRESS
503 W. 33rd St., Chicago 16, Ill.

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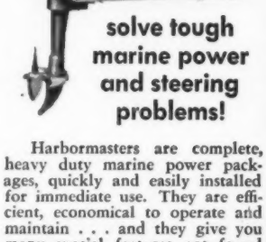
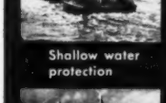
**HARBORMASTERS**



**solve tough marine power and steering problems!**

Steer in any direction with full power

Rugged, powerful, easily installed



Shallow water protection

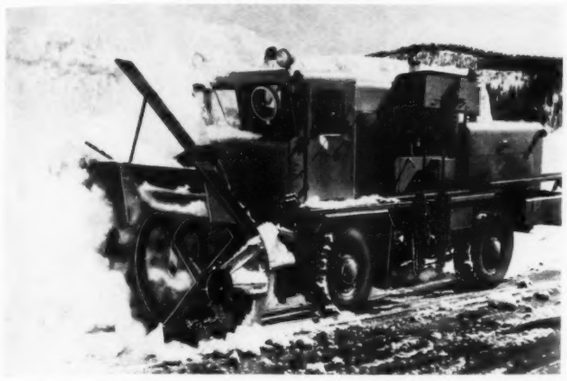
Economical operation and maintenance

Harbormasters are complete, heavy duty marine power packages, quickly and easily installed for immediate use. They are efficient, economical to operate and maintain . . . and they give you many special features not found with ordinary marine power. They are ideal for shallow or deep water, for coastwise service, as well as in harbors, lakes, canals, and rivers.

In hundreds of installations Harbormasters are moving bigger payloads at less cost, in less time. *Send for catalog and get complete details.*

**MURRAY & TREGURTHA, INC.**
*44 Hancock Street, Quincy 71, Massachusetts*

For more facts, circle No. 293



The Snowblast's 2-speed transmission in the cutter and impeller mechanism provides greater versatility, achieving an exceptionally long cast at high speeds, with a shorter cast at the slower speed cycle.

## Full-rotary snowplow operates continuously

A new snowplow, called Snowblast, is announced by the Edward F. Taylor Co.

According to the company, the Snowblast is a four-wheel-drive, four-wheel-steer, full-rotary plow capable of removing 2,000 tons of snow per hour in 8½-foot swaths, and in depths of 7 feet or more. No dozing is required since the plow itself does all the clearing.

At an elevation of 10,000 feet, a Caterpillar Model D337 engine furnishes 200 net horsepower to the plow power train. The plow carrier is a newly designed Coleman truck, powered by a Cummins 180-hp diesel engine.

Weight on the two axles during plowing is equal, making chains virtually unnecessary. Even in the most difficult snow banks or avalanches that are free from debris, the snowplow does not require high tractive power, states the manufacturer.

For further information write to the Edward F. Taylor Co., Dept. C&E, 1237 Shoshone, Denver, Colo., or use the Request Card at page 18. Circle No. 19.

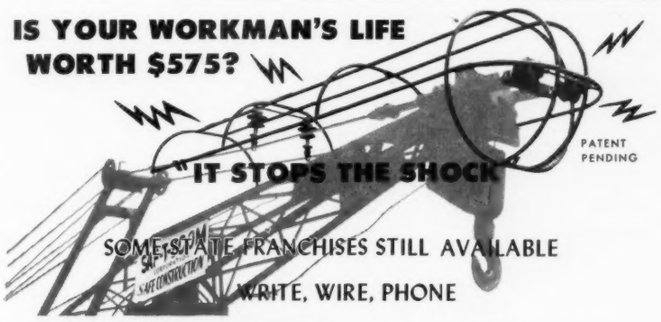
## Triaxial soil tester offers many features

Actual field stress conditions can be simulated readily with the new table-mounted K-W triaxial soil-testing machine, the Tinius Olsen Testing Machine Co. announces.

Any desired lateral pressure up to 50 or 100 psi can be applied to the sample with either air or glycerin. Piping and valves are provided to permit the application of water and vacuum to the upper and lower sample heads in any combination.

On the Model 500, a variable speed drive provides controllable strain rates from 0 to 0.15-inch per minute. The machine is normally used with a 500-pound-capacity load ring, but is designed for a maximum capacity of 2,000 pounds.

For further information write to the Tinius Olsen Testing Machine Co., Dept. C&E, 733 Easton Road, Willow Grove, Pa., or use the Request Card that is bound in at page 18. Circle No. 77.



IS YOUR WORKMAN'S LIFE WORTH $575?
PATENT PENDING
"IT STOPS THE SHOCK"
SOME STATE FRANCHISES STILL AVAILABLE
WRITE, WIRE, PHONE

**SAF-T-BOOM CORP.** 1613 MAIN, LITTLE ROCK, ARK. — FR 5-3291

For more facts, use Request Card at page 18 and circle No. 294

# Faulty Replacements Cost Contractors Thousands of Dollars Annually in Downtime

Even though you usually do not consider the metallurgical makeup of a replacement part for your Bucyrus-Erie shovel or crane, it's an important question. But it's one you won't have to be concerned about if you buy parts from your *authorized* Bucyrus-Erie distributor.

Bucyrus-Erie spends many thousands of dollars every year in testing and developing materials for better wearing qualities under specific types of service. As a result, you get better shovels and cranes — and better parts — than were ever before available.

To make these quality parts available to you, Bucyrus-Erie Company annually *consigns* parts stocks worth millions of dollars to local distributor service shops — all built to original equipment specifications. No other manufacturer of shovels and cranes does so much to assure you of complete service.

Bucyrus-Erie also holds factory training courses to show your local distributor servicemen new ways to provide better service, new ways to make old machines perform at peak efficiency.

When you need repairs, don't gamble on "will fits". Call on the people who are best qualified and *most interested* in doing a good job. The money you save by corner-cutting may be only a down payment on losses you can suffer from breakdowns on key jobs. 2M58

BUCYRUS ERIE

*A Familiar Sign at Scenes of Progress*

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

At Bucyrus-Erie, specifications for molding and core sands — permeability, compression strength, etc. — are rigidly adhered to in the production of castings. Here, a laboratory technician uses an electronic meter to determine the PH (acid-alkaline ratio) of the sand mixture.

Your nearby Bucyrus-Erie distributor has a complete stock of original equipment parts for your machine. Fast follow-through on parts orders is a specialty of his. He's ready to give you speedy service right out on your job.

For more facts, use Request Card at page 18 and circle No. 295

"I'm sorry, sir, this is not a public rest room—and put my newspaper down!"

Once the operator sets the thermostat dial on the new Stow heater, it turns the heat on and off, automatically, to maintain a constant temperature.

## Oil-fired portable heater has built-in thermostat

A recirculating oil-fired portable heater with a built-in thermostat is announced by the Stow Mfg. Co. The thermostat feature, the company points out, saves considerably on fuel, and allows the heater to run up to 30 per cent longer on one tank of kerosene or No. 1 or No. 2 fuel oil.

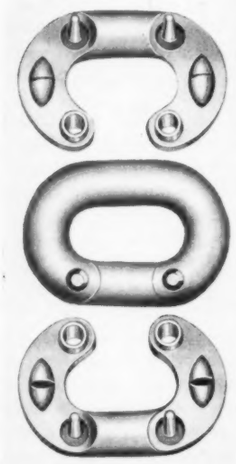
The heaters are available in six different sizes ranging from 100,000 to 1,000,000 Btu per hour.

Other features include an automatic electric ignition, an electrically driven fan, and a twin-disk air control that compensates for variations in fuel, temperature, or altitude, making maximum combustion possible under widely varying conditions. A low-fuel cutoff switch is also provided.

For further information write to the Stow Mfg. Co., Dept. C&E, 40 Shear St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 82.

## Device connects chain quickly, permanently

The Missing Link, a device for quickly and easily connecting hooks, swivels, or rings to chain, or for repairing chain, is available from the



Crosby-Laughlin Division of the American Hoist & Derrick Co.

Missing Links are offered in chain sizes from 3/16 inch to 1⅞ inches.

For further information write to the Crosby-Laughlin Division, American Hoist & Derrick Co., Dept. C&E, Box 570 FY, Fort Wayne, Ind., or use the card at page 18. Circle No. 161.

Greater New Orleans Bridge at stage in which Richmond products were used.

# Another Big One for Richmond!

### Dependable Richmond Form Tying Devices used in form work for the new Greater New Orleans Bridge.

The Greater New Orleans Bridge, spanning the Mississippi River and connecting New Orleans proper with Algiers (a smaller section of the city), is the longest cantilever structure in the United States and the third largest in the world. It is signlficant that the two major contractors for this important project selected Richmond products for their concrete form tying and hanging. Dravo Corporation of Pittsburgh, Pa. used Richmond Tyscrus and accessories in tying the forms for the giant piers supporting the cantilever superstructure. Boh Brothers Construction Company of New Orleans, used the new Richmond Free-Fit Hanger Frames in hanging the approach deck forms.

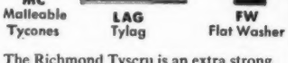
The continued and increasing use of Richmond products on so many of the large, important projects in progress today is a strong testimonial for their time and labor saving qualities.

**FOR FORM TYING**



T2 Tyscru 2 Strut — T4 Tyscru 4 Strut

CLS Continuous Threaded Lagstud

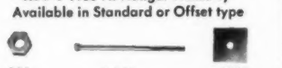


MC Malleable Tycones — LAG Tylag — FW Flat Washer

The Richmond Tyscru is an extra strong, resistance welded tie designed to take abuse encountered in medium and heavy concrete construction. An extremely simple tie, capable of many combinations and uses in the field, it may be used with or without Tycones depending on the desirability of the spreader action, or combined with Continuous Threaded Lagstuds to form an Adjustable Tyscru.

**FOR FORM HANGING**

HFT-F Free-Fit Hanger Frame Ty
Available in Standard or Offset type



LN Lag Nut — LAG Tylag — FW Flat Washer

The Richmond Free-Fit Hanger Frame Ty is made with over-sized free-fit coils to permit a ½" Tylag to pass thru, to be secured from above by means of a Lag Nut. All installations and adjustments can be made from above the deck assuring easier, faster erection. Forms can be brought up tight against the beam flange, thereby minimizing grout leakage.

Richmond has more than 400 time-tested products, backed by 47 years of experience, for any concreting need. Send for a free copy of the current Richmond Handbook describing the full line of Richmond Form Tying Devices, Anchorages and Accessories...and, if you have a specific concreting problem, let Richmond's Technical Department help you. They will show you how to do a better job safely and economically with Richmond products for the concrete construction industry. Write to—

INSIST ON RICHMOND
....AND BE SURE
IT'S RICHMOND

Richmond
SCREW ANCHOR CO., INC.
816-838 LIBERTY AVE., BROOKLYN 8, N. Y.
315 SOUTH FOURTH ST., ST. JOSEPH, MO.

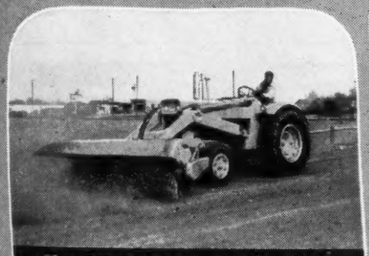
For more facts, use Request Card at page 18 and circle No. 296

*Stretch Dollars – Save Manpower with equipment that does more . . .*

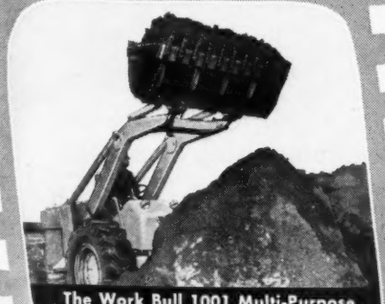
## WORK BULL 303 and 500 LOADER

## —REVERSE INSTANTLY FOR FASTER CYCLING
## —PERFORM A DOZEN DIFFERENT JOBS

The Model 210 Davis Backhoe on the Work Bull 303 can dig flush by simply moving the mast assembly from center to side.



The Rotary Broom on the Work Bull 303 has 96" swath, 30° left and right hydraulic angle control.



The Work Bull 1001 Multi-Purpose Tractor Loader converts into eight different machines.

**POWER MATCHED FOR PROFIT-MAKING PERFORMANCE** The Work Bull 303 and 500 Loader rig have been designed to work together as an integrated unit for performance far above anything else in the medium equipment class. With instant reversing (acceleration and direction of travel are controlled by "side-by-side" forward and reverse foot pedals), torque converter, full-time power steering, 5-speed transmission in both directions, plus a 54.5 h. p. engine, you have power, speed, agility all in one package. The 500 Loader has low pivot points for "bull-dozer" type thrust, 43° rollback at ground level for bigger payloads and more breakaway, and telescoping arms for abnormal lifting height.

**MANY ATTACHMENTS FOR MULTI-PURPOSE, HEAVY-DUTY JOBS** This combination lets you get more production out of one machine because it is easily changed from a 7/8 cubic yard Loader to a Rotary Sweeper, Angle Dozer, Lift Fork, Scarifier, Swinging Crane, or Pick-up Sweeper – right in the field if necessary. **The Davis Backhoe attaches directly to the rig – removes in five minutes for all-around operations.**

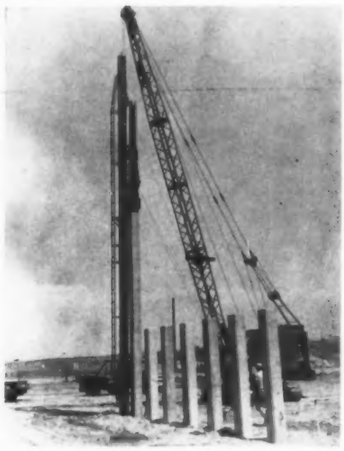
**LOW PACKAGE PRICE** This combination will cost you less than any other medium-sized, all-purpose rig. And because of its extreme versatility, maneuverability, and high quality, it will make you more money on a wider range of jobs.

**OTHER MASSEY-FERGUSON INDUSTRIAL EQUIPMENT** includes the Work Bull 1001 Multi-Purpose Tractor Loader (60.3 h. p.), Work Bull 202 (40 h. p.) with integrated Davis Loader-Backhoe, and the Work Bull Fork Lift with 10 easy-to-change attachments.

**For information on the complete Massey-Ferguson line ask for Brochure G-4. For specific information on the Work Bull 303 ask for Brochure W-3. *Write Massey-Ferguson Industrial Division, 1009 South West Street, Wichita 13N, Kansas.***

**MASSEY-FERGUSON INDUSTRIAL DIVISION**

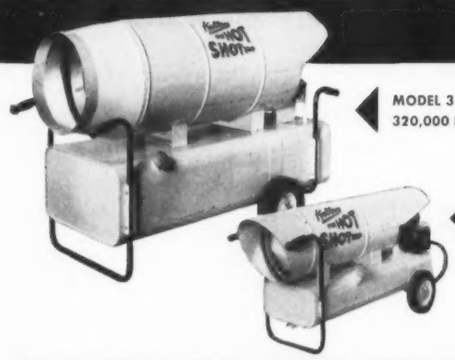
For more facts, use Request Card at page 18 and circle No. 297



**Driving prestressed-concrete** piling 14 inches × 14 inches × 38 feet long, for the Eldorado Materials Co., in Wichita, Kansas, is a Delmag D-12 diesel pile hammer. In winter operations, its completely self-contained design eliminates frozen air, steam, or water lines and the problem of getting water to the job site. For further information write to **The Foundation Equipment Corp.**, Dept. C&E, 100 Elizabeth St., Newcomerstown, Ohio, or use the Request Card at page 18. Circle No. 116.


MAKE COLD WEATHER Profitable

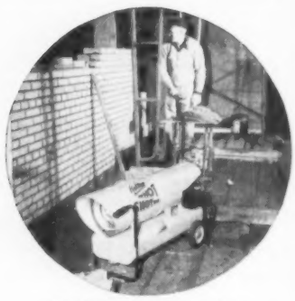
Kelley HOT SHOT SPACE HEATERS



MODEL 320 KHA
320,000 BTU/HR

MODEL 120 KHA
120,000 BTU/HR

LET 'ER BLOW OUTSIDE



WORK GOES ON INSIDE
. . . ON WALLS, FLOORS
AND SCAFFOLDS

Features of Kelley HOT SHOT Space Heaters that will put dollars in your pocket: Clean hot air fast and safely . . . Put them where you want them with wheels and handles . . . They operate 12-16 hours on kerosene or #1 fuel oil . . . and shut off automatically when fuel gets low . . . Thermostat adjustment for temperature control . . . Grounded-type cord . . . Powerful fan blows up to 2000 CFM . . . The HOT SHOT is terrific! Write today for name and address of your Kelley dealer.

★ *Heats buildings during construction.*

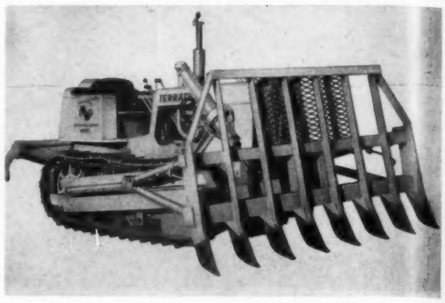
★ *Dries, warms construction materials.*

★ *Warms workmen and work areas, outdoors or in.*

Kelley MACHINE DIVISION
THE WIESNER-RAPP CO., INC.
285 Hinman Ave., Buffalo 23, N. Y.
Please send me more information on the Kelley HOT SHOTS.
NAME _____
STREET _____
CITY _____ ZONE ___ STATE _____

For more facts, use coupon, or Request Card at page 18 and circle No. 298


This land-clearing rake can be used in place of either power-angling or power-tilt dozer blades on the Case TerraTrac Model 800 and Model 1000 crawler tractors.



## Heavy-duty root rakes speed land clearing

Heavy-duty brush rakes designed to speed land clearing are available as an interchangeable attachment for Case TerraTrac Model 800 and 1000 dozers, and the new Model 1000 tractor shovel with rear-hinged bucket.

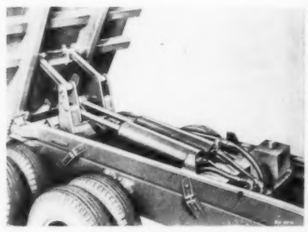
The rakes can be used in place of a moldboard on power-angling and power-tilting tractor dozers, or in place of the shovel bucket, and are operated with the same hydraulic system.

Ribs extend high above the frame to prevent brush from spilling over the top and endangering tractor or operator. The curvature and spacing of the teeth allow loose soil to sift through, while roots and stumps are snapped out, the company reports.

For further information write to the J. I. Case Co., Dept. C&E, Racine, Wis., or use the Request Card that is bound in at page 18 of this issue. Circle No. 72.

## Heavy-duty truck hoist gives 70-degree tilt

The Heil Co. announces a heavy-duty twin-cylinder truck hoist designed to tilt a dump body to a maximum of 70 degrees.



The new unit features a double-acting hydraulic system to power the body up, and also to pull down to where gravity takes over in lowering the body to its carrying position. Each cylinder is 8 inches in diameter and has a 24-inch stroke. The hoist is also of double lift-arm design, said to afford exceptional stability during dumping operations, even when the truck is not on level ground.

Designed to fit any heavy-duty truck having a standard frame width, the hoist is said to be particularly desirable for scoop-end "rock bodies" or "quarry bodies", though it can also be used under conventional bodies having tail gates.

For further information write to The Heil Co., Dept. C&E, 3003 W. Montana Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 10.


JERSEY SPREADERS

. . . World's fastest accurate paving Spreaders!

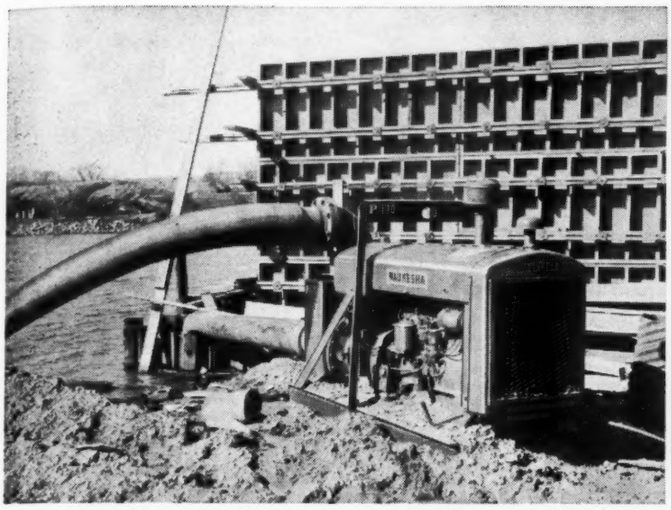
Lay a smooth, even spread at the rate of up to 1000 tons per hour — and do it easily and economically, fast and accurately without delay to hauling units. Two models available to meet all requirements.

JERSEY SPREADER REG. TRADE MARK

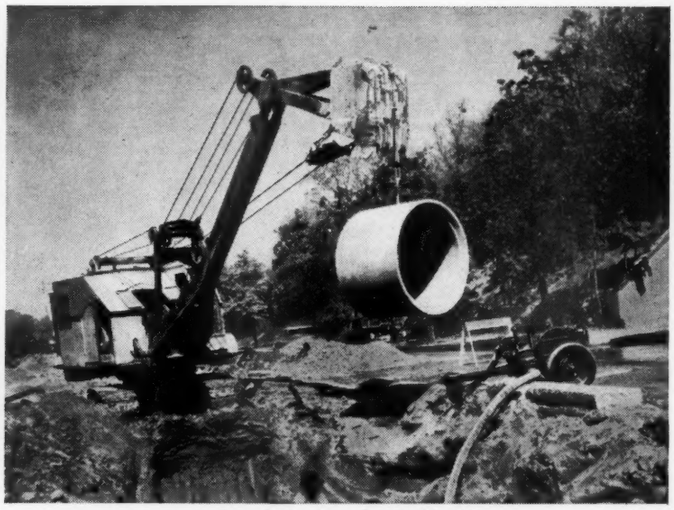
Write now for complete information and illustrated literature.

TRACTOR SPREADER COMPANY
MANUFACTURERS OF THE JERSEY SPREADER
HASBROUCK HEIGHTS, NEW JERSEY 38-29

For more facts, use Request Card at page 18 and circle No. 299

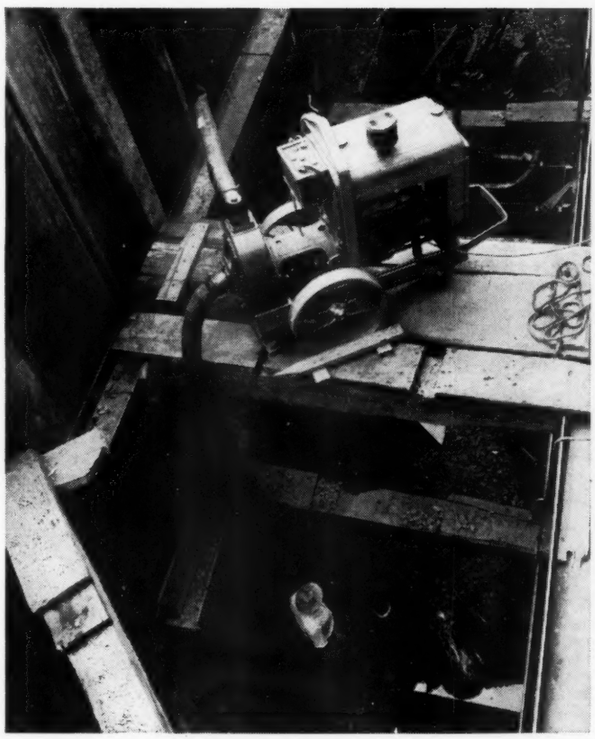


**On cofferdam dewatering** you can't beat Marlow Pumps. This 10" Marlow self-primer, owned by a construction company in Syracuse, N.Y., was used to dewater a cofferdam on a bridge job at Utica, N.Y.



**Large concrete pipe** is being installed in an excavation at Malden, Mass. by S. Rotonde & Sons, Inc. Marlow "Mud-Hog" diaphragm pumps were used to keep the hole dry and workable.

# Construction News Pictures



**Marlow Self-primers** helped Al Di Marco, Inc. keep the excavation dry during the construction of a 700 foot by-pass line for the Saw Mill River trunk sewer at Elmsford, N.Y. The pumps were run 14 hours a day, five days a week.

**Marlow "Mud-Hog"** diaphragm pumps were used by Berlante Construction Company of Harrison, N.Y. on a sewer job at Pleasantville. The pumps operated on a 15 foot lift and had 50 feet of suction and discharge hose.


Write today for Bulletin C-04

Marlow PUMPS ®

DIVISION OF

**BELL & GOSSETT CO.**

Midland Park, New Jersey

Longview, Texas • Morton Grove, Illinois

7-295

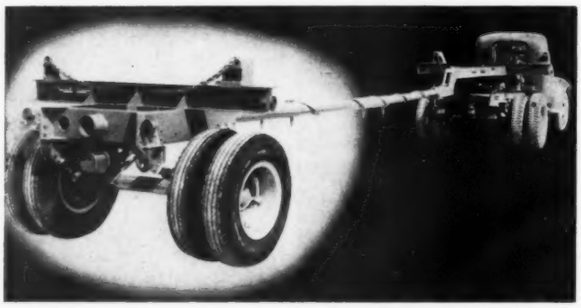
For more facts, use Request Card at page 18 and circle No. 300

## Open-gear lubricant designed for winter use

The Kendall Refining Co. announces a new open-gear lubricant, Kendall SR-12X, designed especially for winter use.

According to the company, SR-12X is a special heavy oil compound cutback with a nontoxic, nonvolatile solvent which permits ease of application at temperatures approaching zero. In addition, it is noncorrosive, very adhesive, and resists oxidation.

For further information write to the Kendall Refining Co., Dept. C&E, 77 N. Kendall Ave., Bradford, Pa., or use the Request Card at page 18. Circle No. 93.



Available in single, tandem, and triple-axle models, these pole trailers feature capacities from 10 to 75 tons. Standard equipment includes lights, reflectors, and air or vacuum brakes.

## New pole-type trailers feature improved design

Transport Trailers, Inc., announces an improved design in its telescopic-tongued pole-type trailer.

Designed to convey prestressed-concrete beams, this trailer is extendable to a 30-foot wheelbase, and retractable to a 16-foot wheelbase. It is available in single, tandem, and triple-axle models. Single-axle trailers are qualified for loads from 10 to 15 tons; tandem-axle units are rated at 15 to 30 tons; and the triple-axle models feature capacities up to 75 tons.

Standard pole trailers have a 30-foot tongue, although extra-length tongues are also available. Tow-type trailers may be obtained with swivel bolsters.

For further information write to Transport Trailers, Inc., Dept. C&E, P. O. Box 968, Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 26.

*To obtain further information on products described in this section, circle the number at the end of the item on the Request Card at page 18.*

## Anti-stripping additives assure asphalt adhesion

Anti-stripping additives said to assure asphalt adhesion to the aggregate even in the presence of water are offered by Armour & Co.

Called Redicote, these cationic chemical compounds mix easily with bituminous material. Besides the advantage of all-weather application, they also permit the use of a larger selection of aggregates, according to the manufacturer.

For further information write to Armour & Co., Dept. C&E, 1355 W. 31st St., Chicago 90, Ill., or use the Request Card at page 18. Circle No. 136.


NF

CONSTRUCTION CASTINGS OF

★ SOUND QUALITY
★ SUPERIOR FINISH
★ SOLID VALUE
DELIVERED ON TIME

Patterns on hand for over 15,000 different Gray Iron and Ductile Iron construction castings.

Write for our new 165-page completely illustrated catalog.

NEENAH FOUNDRY COMPANY
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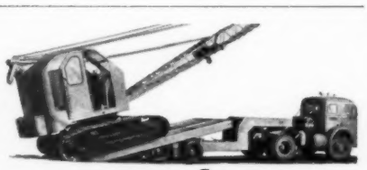
Chicago Office: 5445 North Neva Ave., Chicago 31, Illinois

For more facts, circle No. 301

NEW OTG MILLER Tilt-Top 15 TON capacity for:

- Insley K½ Hoe/dragline
- Unit 510-C
- Barber Greene paver
- Caterpillar 977-D
- Allis Chalmers HD 11-G
- Oliver OC-15
- International TD-14
- International HO Payloader



OTG-15 ton $2,595.00*

with GOOSENECK tongue and TANDEM AXLE

Heavy box section walking beams oscillate freely on each side—permit each set of tandem dual wheels to rise and fall independently . . . assuring less jarring, less frame strain and a more level ride over rough terrain. Timken roller bearings on walking beam shaft and axles assure positive alignment . . . minimum maintenance.

Here is all the speed, convenience and safety for which MILLER Tilt-Tops have gained wide acceptance . . . engineered into a big 30,000 lb. capacity, gooseneck Tilt-Top. Any one of the heavy equipment pieces listed above, and many others, can be loaded by ONE man in just TWO minutes. The OTG's massive platform measuring 8 x 16 ft. — 20 ft. long if desired, provides all the room you need for big rigs. Built like a bridge underneath, it's topped with 2 inch, traction-sure oak . . . yet is balanced like a watch . . . tilts under a man's weight for loading. And the platform pivots further back than competing tilt trailers . . . permitting lower platform height without a troublesome "beaver tail" ridge. Why bother with slower loading, more awkward trailers any longer — see this production booster at your MILLER distributor today!

*F. O. B. Milwaukee, Wis. Complete with platform and tires. Brakes and optional equipment extra. *Plus 10% Federal Tax

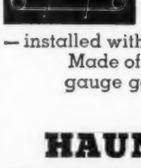
See your MILLER distributor or write for FREE literature to:

Miller® Tilt-Top Trailer Inc.
456-K S. 92nd Street, Milwaukee 14, Wisconsin

For more facts, use Request Card at page 18 and circle No. 302

"ON THE JOB WHEN YOU WANT THEM!"

SYLGAB STEEL and WIRE ACCESSORIES for Fast FIREPROOFING of Structural Steel



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5' lengths
— installed with lightning speed.
Made of #12 or #10 gauge galvanized.

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HAUNCH STIFFENER

for beams over 16" deep. Made of #10 or #12 gauge galvanized wire.

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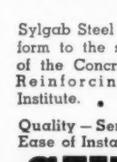

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More rigid than any wire. Used in conjunction with
SYLGAB SNAP-ON HAIRPIN CLIP
*to tie main and cross furring together.*

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Sylgab Steel & Wire Accessories conform to the specifications of the Concrete Reinforcing Steel Institute.

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*Request Catalog—Phone or Wire Collect*

For more facts, circle No. 303

The Batch King has a physical capacity of six 6,000-pound batches on jobs where legal restrictions do not apply. On over-the-highway jobs, it will easily haul four batches, the manufacturer reports.

## Heavy-duty batch truck has six-batch capacity

A heavy-duty truck especially designed for batch work, and with a maximum capacity of six 6,000-pound batches, is announced by Cook Bros. Equipment Co.

The Batch King is powered by a 235-hp V-8 valve-in-head engine, and has a 5-speed main transmission and a 3-speed auxiliary transmission. Its front axle is rated at 18,000 pounds capacity.

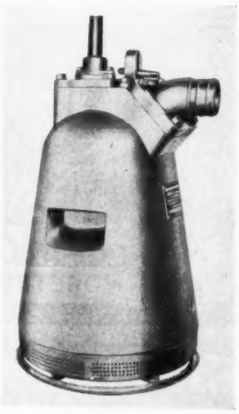
As a straight dump truck, the Batch King has a physical capacity of 20 tons.

For further information write to Cook Bros. Equipment Co., Dept. C&E, 3334 San Fernando Road, Los Angeles 65, Calif., or use the Request Card at page 18. Circle No. 68.

## New portable pumps are fully submersible

A new portable pump for contractors, designated Flygt, is announced by the Stenberg Mfg. Corp.

These pumps are fully submersible and are operated by a built-in electric motor. They will drain water down to an inch in depth, and reportedly



do not suffer damage if allowed to run dry. Pumping starts again instantly when water flows into the sump.

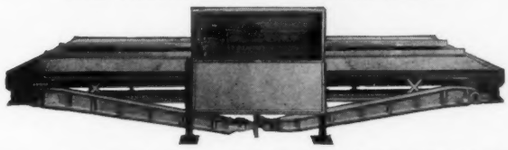
According to the manufacturer, Flygt pumps can handle a very high proportion of solids, and can run for long periods without supervision.

The pumps are available in capacities from 10 to 1,500 gpm.

For further information write to the Stenberg Mfg. Corp., Dept. C&E, N. Hoosick, Hoosick Falls, N. Y., or use the Request Card at page 18. Circle No. 95.


**WINSLOW—PORTABLE TRUCK SCALE**

THE CONTRACTORS' SPECIAL SCALE



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacity: 15-18-20-30, 40 and 50 tons.

Write us for name of your nearest distributor

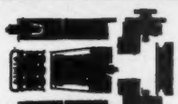
**WINSLOW SCALE COMPANY** P.O. Box 1198 Terre Haute, Indiana

For more facts, use Request Card at page 18 and circle No. 304

**CONTRACTORS CUT COSTS WITH EIMCOS'**

**Move more earth at less cost with Eimco heavy-duty equipment**

**INDEPENDENT TRACK ASSEMBLY**
Each track is powered and controlled separately — Tractor spin turns in it's own length, with one track in forward and the other in reverse.



**UNIT ASSEMBLY**
Each major tractor component is a separate assembly for easy maintenance or removal without disturbing other components.

**INSTANT REVERSAL**
No stopping, manual clutching or gear shifting to change directions — A pull on the track control levers immediately reverses the tractor.

**FULL VISIBILITY**
Up-front operators position eliminates all guess work in dozing, digging, pushing and loading operations.

Eimco heavy-duty earth moving machinery will permit lower bids on construction work.

Here are reports from a few jobs where Eimco equipment is being used:

1. Underground limestone quarry working an Eimco 105 on 2 levels to do all underground loading. — "Our maintenance parts and labor for the past 21 months have cost 2½ cents per ton."

2. Road contractors in the deep South — "We now have more than 17,000 hours on our 105 and have not had to open the transmission for any reason."

3. "We averaged better than 45 feet a day on our job mostly because of the 105's." — This letter from a tunnel contractor who is driving a large heading with two 105's working side by side.

4. Quarry contractor — "In a few days we should receive our third Eimco 105. These machines are gradually taking over all production and are replacing the boom shovel."

5. Railroad contractor — "Our 105 has replaced a 1½ yard boom shovel and a bulldozer we had used to move stone up to the shovel.

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EXPORT OFFICE, 51-52 SOUTH STREET, NEW YORK, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

B-346

For more facts, use Request Card at page 18 and circle No. 305

**Sawing contraction joints on a new strip of concrete** south of Denver, Colo., on U. S. 87, is this Eveready 36-hp concrete saw. According to the contractor, Western Paving Co., of Denver, the saw cuts at least 2,500 feet of concrete per 8-hour working day. For further information write to the **Eveready BrikSaw Co.**, Dept. 549, Dept. C&E, 1104 Union Ave., Kansas City, Mo., or use the Request Card at page 18. Circle No. 56.

## Bridge-deck finisher features simple design

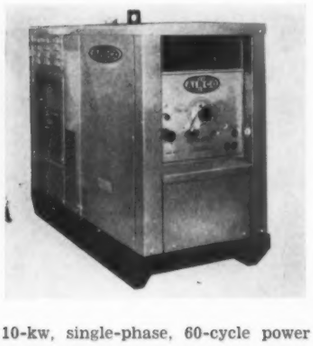
A new type of concrete-bridge-deck vibratory finisher is offered by the Master Vibrator Co.

The unit has a total weight of less than 3,000 pounds, and is designed to strike off, vibrate, compact, and finish concrete to specification in one pass, providing a smooth, accurate finish. It is simply designed—5 feet wide, 2 feet 11 inches high, and adjustable in length from 15 to 31 feet. The entire

## Welders are powered by air-cooled engines

New drooping-voltage arc welders are available from Air Reduction in three types: 250-amp dc, 300-amp ac-dc, and 300-amp ac-dc Heliwelder.

All machines provide 115/230-volt,



10-kw, single-phase, 60-cycle power when operated as power plants. They have 115-volt 1-kw dc auxiliary power available for operating lights and power tools while welding.

These machines are equipped with Hercules-Lycoming engines. Optional accessories include two-wheel road trailers, canvas covers, and a water-circulating system.

For further information write to the Air Reduction Sales Co., Dept. C&E, 150 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 52.

## Tough new tire features steel cord-breaker strips

A pneumatic industrial tire with steel cord-breaker construction is offered by The Goodyear Tire & Rubber Co.

Named the Steel Guard Industrial, the tire features a puncture-resisting barrier of two crisscrossed steel cord-breaker strips, locked firmly in place beneath the tread by specially compounded rubber.

The tire is recommended primarily for use in operations where sharp puncturing objects are a hazard, and is available in a wide range of sizes.

For further information write to The Goodyear Tire & Rubber Co., Dept. C&E, 1144 E. Market, Akron 16, Ohio, or use the Request Card at page 18. Circle No. 23.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...the bridge-deck finisher, a ...aster 3-kw dc generator fur...shes power to the two 1-hp vi...rator motors mounted on the vi...atory beams. Easy to operate, ...e entire machine telescopes to ...ish any deck 15 to 31 feet wide.

unit can be moved easily by a crane or A-frame, and comes equipped with a special sling for picking it up.

The new finisher has four 12-inch flanged wheels which ride on standard forms, bulb angles, or pipe rails with no damage due to weight. Low-geared winches on each side of the machine have 100 feet of 3/16-inch cable, which is strung out in front of the machine and fastened by a special hook to the bulb angle. As the cable is reeled in, the machine pulls itself forward at a uniform rate of travel of 2 to 6 fpm.

For further information write to the Master Vibrator Co., Dept. C&E, 1752 Stanley Ave., Dayton, Ohio, or use the Request Card at page 18. Circle No. 67.

A maximum bucket tilt-back of 25 degrees and a 50-degree maximum dump angle are features on the Henry Model 900. Standard equipment includes a self-leveling bucket and a bucket position indicator.

## New tractor shovel lifts 3,000 pounds to 9 feet

A new tractor shovel, designed specifically for the Fordson Major tractor, is announced by the Henry Mfg. Co., Inc.

Designated Model 900, the unit includes a self-leveling bucket and a bucket position indicator as standard equipment.

The new machine has a breakaway capacity of 5,000 pounds and a lifting capacity of 3,000 pounds to a full height of 9 feet.

Maximum tilt-back of its bucket is 25 degrees, while the bucket's maximum dump angle is 50 degrees. With the bucket at a 40-degree dump angle at 9 feet, the Model 900 has a reach of 33 inches.

Two different bucket sizes are available for the Henry unit: a 60-inch bucket with a ⅝-yard-struck capacity, and a 66-inch bucket with a capacity of ¾-yard struck.

For further information write to the Henry Mfg. Co., Inc., Dept. C&E, 1700 N. Clay St., Topeka, Kans., or use the Request Card at page 18. Circle No. 122.

## Hydraulic pipe cutter makes accurate cuts fast

A heavy-duty hydraulic pipe cutter is offered by the Wheeler Mfg. Corp.

According to the manufacturer, in less than one minute the unit will cut cast-iron water main or cement-lined

cast-iron water main in diameters from 4 to 12 inches; standard or extra-heavy soil pipe from 6 to 15 inches; terra cotta or clay tile from 6 to 36 inches; and transite pressure pipe from 6 to 10 inches.

Cuts are said to be clean and accurate, and no vise or turning is required.

For further information write to the Wheeler Mfg. Corp., Dept. C&E, Ross Road, Ashtabula, Ohio, or use the Request Card at page 18. Circle No. 101.


# ...offer "Jimmy" Diesel
## ...ERS OF CONSTRUCTION EQUIPMENT

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...ontractors generally agree that engine standard-...ation pays big dividends. The wide use of GM ...iesel engines in more different makes of equip-...ent than any other Diesel provides unequalled ...pportunities for standardization—and the fact that GM Diesel covers the range from 30 to 893 H.P. with *only 3 cylinder sizes* results in highest parts interchangeability, lowest maintenance cost. Write for booklet, "STANDARDIZE YOUR POWER"—and learn the reasons why.

**...ETROIT DIESEL ENGINE DIVISION OF GENERAL MOTORS, Detroit 28, Michigan**

*In Canada:* GENERAL MOTORS DIESEL LIMITED, London, Ontario

GM GENERAL MOTORS DIESEL POWER

***IT PAYS TO STANDARDIZE ON...***

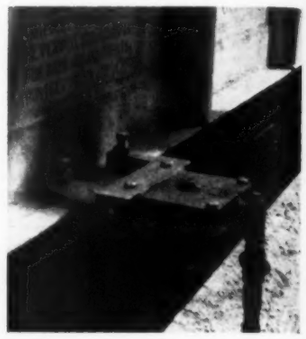
For more facts, use Request Card at page 18 and circle No. 306

**An easily assembled job shack** made of Fiberglas translucent plastic panels, the Kemlite unit measures 10 feet wide, 12 feet long, and 7 feet high. Called Kemhut, the shack requires no internal bracing. The rotproof, weather-resistant panels are secured with rustproof fastenings for added rigidity, using special washers to insure watertightness. The Kemhut comes complete with pre-cut panels, ventilating louver, hinged door, aluminum angles, fastenings, and hardware. It weighs approximately 150 pounds. For further information write to the **Kemlite Corp.**, Dept. C&E, 101 N. Republic Ave., Joliet, Ill., or use the Request Card at page 18. Circle No. 45.

## Offer external vibrator with single moving part

A pneumatic external vibrator for use on bins, hoppers, prestressed-concrete forms and screeds, railroad cars, and many others, is available from McCaron Bros.

Designated Jetshaker, the unit features only one moving part, an air



jet-driven rotary eccentric turbine of special bronze alloy. The only wearing parts are two ball bearings.

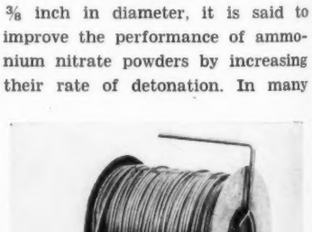
The Jetshaker is said to exert a force of 2,600 pounds, 8,000 times per minute on forms of all sizes. Air consumption is rated at 25 to 40 cfm at 100 psi.

For further information write to McCaron Bros., Dept. C&E, P. O. Box 336, Baldwin Park, Calif., or use the Request Card at page 18. Circle No. 153.

## New detonating fuse for insensitive agents

A new detonating fuse for firing insensitive blasting agents is announced by the Austin Powder Co.

A 175-grain fuse approximately 3/8 inch in diameter, it is said to improve the performance of ammonium nitrate powders by increasing their rate of detonation. In many



cases, the new detonating fuse also eliminates the need for a high-explosives primer.

Austin detonating fuse is provided with a tough, waterproof, polyethylene coating that reportedly will not chip, peel, or crack while being laid. It is insensitive to shock, abrasion, and stray electrical currents. In addition, it can be detonated only with fuse and cap or electric blasting cap.

The new fuse is packaged in 500-foot reels.

For further information write to the Austin Powder Co., Dept. C&E, Rockefeller Bldg., Cleveland 13, Ohio, or use the Request Card at page 18. Circle No. 3.


Every builder can profit from this new handbook on

**CONSTRUCTION MANAGEMENT AND SUPERINTENDENCE**

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An up-to-date guide to the modern methods of coordination and cooperation required for cost-saving and profit-making construction.
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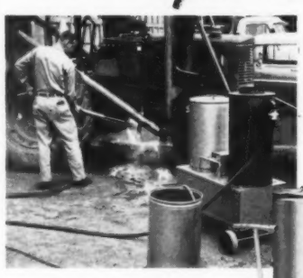
For more facts, use coupon or circle No. 307

**Good Machinery Maintenance Begins With a *Northeast Vapor Jet Cleaner***



Over 30 years experience in the design and manufacture of steam cleaning machines brings you the most simplified and dependable unit ever built!

Northeast Vapor Jet Cleaner with Exclusive SIPHON GUN

High performance at a low price . . .

only **$545.00**

For complete information and name of nearest distributor, write

**NORTHEAST INDUSTRIES, INC.**
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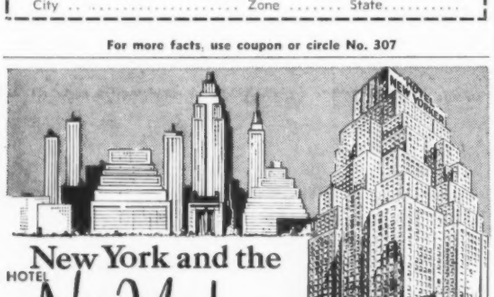
For more facts, circle No. 309



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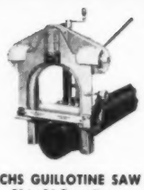
**World famed hotels—Teletype service—Television**

For more facts, circle No. 308

**WACHS *Portable***
**POWER AND MANUAL PIPE CUTTERS**
2" TO 72" CAPACITY



**WACHS GUILLOTINE SAW**
2" to 8" Capacity
Electric or Air Drive

**"BIG" GUILLOTINE SAW**
10" to 16" Capacity

**WACHS NATIONAL SAW**
"The milling machine on wheels"
Cuts 10" to 72" Pipe

**WACHS STRICKLER RATCHET CUTTER**
"Lathe Type Cuts"
3 sizes—2½" to 24" Capacity

Write for descriptive bulletins

**THE E. H. WACHS COMPANY**
1525 NORTH DAYTON STREET — CHICAGO 22, ILLINOIS

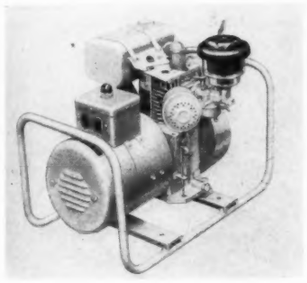
For more facts, circle No. 310

**A gross combination weight rating of 65,000 pounds** is a feature of this Diamond T Model 921-BR truck tractor. The unit is powered by a Cummins HRF-6 diesel engine which develops 190 brake horsepower at a governed speed of 2,000 rpm. Standard front and rear axles are Timkens, rated at 11,000 and 23,000 pounds, respectively. According to the manufacturer, 6-wheel models of this unit increase the gross combination weight to 76,000 pounds, with the gross vehicle weight as high as 48,000 pounds, making the vehicle particularly well suited for heavy-duty dump and mixer service. For further information write to the **Diamond T Motor Truck Co.**, Dept. C&E, 4401 W. 26th St., Chicago, Ill., or use the Request Card at page 18. Circle No. 81.

## New generator plants are portable units

Two new electric generating plants are announced by the Pioneer Gen-E-Motor Corp.

The 1,000-watt model weighs 72 pounds, and the 1,500-watt unit



weighs 109 pounds. Standard equipment includes recoil rope starting, duplex receptacles, a pilot light, and a sturdy carrying frame.

According to the manufacturer, vibration is practically nonexistent.

For further information write to the Pioneer Gen-E-Motor Corp., Dept. C&E, 5841-49 W. Dickens Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 61.

## New marking material codes steel permanently

A marking material that can be placed on bare metal to identify iron and steel sections—and which instantly penetrates subsequent paint coatings—is available from Phillips Products, Inc.

Called Penapaint, the material cannot rub or wash off, the manufacturer states. When it has served its purpose, it can easily be covered with a compound called Penapaint Mask. This compound is sprayed over the code number, dries quickly, and is said to provide a good base for any type of finish paint coating.

For further information write to Phillips Products, Inc., Dept. C&E, 1435 E. 17th St., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 130.

---

*For further information on any product described in this section, circle the indicated number on the Request Card at page 18.*

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TRENCHES

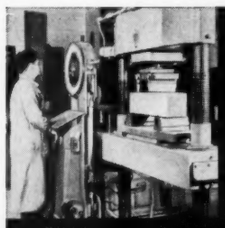
**2¾" to 8" wide • Depths to 6'**
**Self-Propelled•Hydraulic Drive**
**Low Cost • Pays for Itself!**

The economic Arps Model M Trench-Devil will handle most of your trenching jobs faster, easier and at lowest cost per foot of trench. For the largest percentage of ditching work — foundations, water services, underground wiring, gas lines, sprinkler systems — this heavy duty, one-man outfit will outdig larger units costing many times its low price. Get more information *now* on this and other famous Arps Trenchers for larger and smaller jobs. The Arps Corporation, New Holstein, Wis. Dept. C&E.

ARPS CORPORATION
NEW HOLSTEIN, WIS.

TRENCHERS
HALF-TRACKS • BULLDOZERS
UTILITY BLADES

For more facts, circle No. 312



Just what happens when you add calcium chloride to portland cement?

***What happens to the early strength? Ultimate strength? Workability, water-cement ratio, density? How does it offset the adverse effects of low temperatures? What are its effects on setting time and curing?***

The facts on this use of calcium chloride, as reported by recognized national authorities, are included in a 39-page booklet, "The Effects of Calcium Chloride on Portland Cement," which we would like to send you.

The addition of calcium chloride to portland cement mixes will produce *proved*, measurable benefits both during and after construction. It is not offered as a cure-all and will not replace proper design, materials or workmanship.

**SOLVAY Calcium Chloride speeds but does not change the normal chemical action of portland cement.** Impartial tests by the National Bureau of Standards proved its advantages in cold weather concreting. This use of calcium chloride is recommended or approved by leading authorities, including American Concrete Institute and Portland Cement Association.

**SOLVAY PROCESS DIVISION**
**61 Broadway, New York 6, N. Y.**

Please send me, without cost or obligation, a copy of your 39-page book, "The Effects of Calcium Chloride on Portland Cement."

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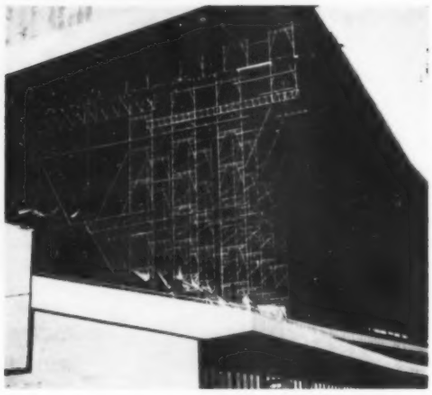
Position_____
Company_____
Phone_____
Address_____
City_____ Zone_____ State_____ 60-10

Allied Chemical
**SOLVAY PROCESS DIVISION**
61 Broadway, New York 6, N.Y.

*SOLVAY branch offices and dealers are located in major centers from coast to coast.*
For more facts, use coupon or circle No. 313



**On the grandstand of the new Roosevelt Raceway,** Westbury, N. Y., the general contractor, George A. Fuller Co., reportedly saved considerable time and money by erecting this 59-foot-high 21-inch-wide rolling Trouble Saver sectional steel scaffolding to move electricians, plumbers, and painters to their respective work. Note cantilever scaffolding section at top front. Planking used at convenient levels supplied working platforms. The Trouble Saver system consists of prefabricated 5-foot-wide end frames in 3 to 6-foot 6-inch heights, which are joined by pivoted diagonal braces secured by fast-acting locking mechanisms. For further information on Trouble Saver scaffolding, write to **The Patent Scaffolding Co., Inc.,** Dept. C&E, 38-21 12th St., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 25.


# MAKE BIG MONEY IN PAVING!

## NEW LOW COST ALL-PURPOSE ROLLER LETS YOU START WITH SMALL INVESTMENT

Cash in on the tremendous demand in the paving field. The General all-purpose, heavy duty, power operated roller lets you pave asphalt driveways and walks, parking lots, service stations. Roll lawns, tennis courts, playgrounds, parks and municipal properties. The General all-purpose roller is time tested and job proven — built to take a beating and withstand years of rugged service. Features a new automatic transmission with full reverse to give complete maneuverability in tight spaces. Simple, foolproof, adjustable weight control lets you roll anything from blacktop driveways to highways with equal ease. Exclusive fingertip operation of all controls on a single lever — brake, transmission and throttle. High curb clearance allows precision rolling close to buildings and obstructions. Hinged hood permits ready accessibility to automatic transmission and engine for easy service and maintenance. General machines now in use the world over testify to their durability, efficiency, economy, and trouble-free operation. Write or call for full information.

ONLY $995 f.o.b. factory

### WORKS ALL YEAR 'ROUND ON MANY DIFFERENT JOBS

A roller lets you take jobs all year 'round. Customers are everywhere — home owners, landscapers, municipal governments. Has all the features found in rollers costing twice as much: Oversized water tank with individual controls both with compression and guide roll — with dual scrapers and large cocoa mats. A real professional contractor's roller that enables you to take ANY JOB. Write or call for full information.

**DEALERS!**
WRITE – WIRE – PHONE
Mr. McCaughey
Choice Territories Still Open
Tilden 5-5401

### LOOK AT ALL THESE FEATURES

Rolls full 32". Fully automatic reversing transmission. Ruggedly constructed. Heavy duty front forks made of ½" plate. Main frame ⅜" plate. Maximum weight over 2000 lbs. Oversize water tank at no extra cost. Cocoa mats and scrapers both rolls included.

**GENERAL ENGINES CO.** ROUTE 130, THOROFARE, N. J. • CALL TILDEN 5-5401

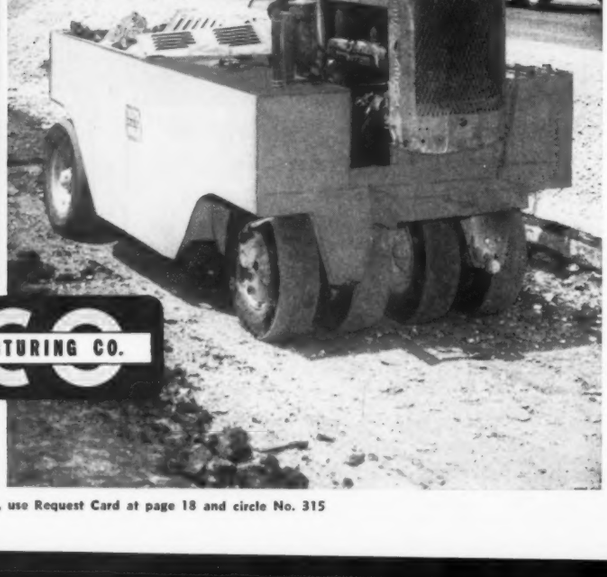
For more facts, use Request Card at page 18 and circle No. 314

# FOR THE TOUGH JOBS

## CONTRACTORS PREFER BMCO

Job: Widening U.S. 81
Location: Bexar County, Texas
Contractor: Killian-House Co.

BMCO was called upon for the extremely tough job of widening U.S. 81, the greatest traffic street in San Antonio, without stopping the flow of traffic.



**BMCO** BROWNING MANUFACTURING CO.

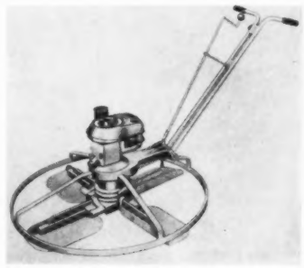
111 HUMBLE AVE. • P. O. BOX 2707
WAlnut 3-4331 • SAN ANTONIO, TEXAS

For more facts, use Request Card at page 18 and circle No. 315


## Cement-finishing machine available in two models

A cement-finishing machine, said to be lighter and more stable than previous models, is available from the Dart Mfg. & Sales Co.

Known as the Superior-Dart Lo-Boy, the finisher has an offset design of tangential arm mountings which equalize the weight on the blade surfaces. This puts more support of the machine onto the center of the blade



for longer equipment life and a more even surface, according to the manufacturer. A large control handle close to the operator's hand allows easier blade tilting from float to finish.

On the Lo-Boy, if the blade hits any obstruction while troweling under power, a mercury safety switch located in the handle kills the motor in only one quarter revolution. The unit's stationary guard ring rides the wall to within ⅜ inch.

The Lo-Boy is available in the 210-pound Senior with 44-inch-diameter blade sweep, and the 145-pound Junior with 33-inch sweep.

For further information write to the Dart Mfg. & Sales Co., Dept. C&E, 1002 S. Jason St., Denver 23, Colo., or use the Request Card at page 18. Circle No. 47.

## Prestressed-beam trailer loads, unloads unaided

A highway trailer designed to haul large concrete beams from casting plant to job site is announced by Lufkin Trailers.

Designated Straddle Trailer, the unit is engineered to load, carry, and unload the beams without benefit of any other equipment. Dual tandem wheels straddle the concrete beams, pins are inserted in each end, and hydraulic lifts load the cargo automatically.

The trailer is approximately 80 feet long. It weighs about 20,000

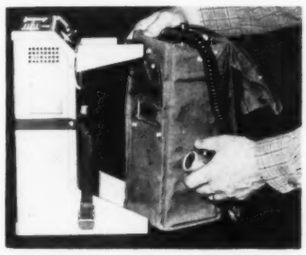
Designed to load and unload 70-foot prestressed-concrete beams automatically, as well as transport them from the plant to the job site, the Straddle Trailer is 80 feet long and weighs about 20,000 pounds.

pounds and carries beams with ground clearances of 22½ inches.

For further information write to Lufkin Trailers, division of Lufkin Foundry & Machine Co., Dept. C&E, Lufkin, Texas, or use the Request Card at page 18. Circle No. 74.

## New power unit announced for field radiophone use

The Morrow Radio Mfg. Co. offers the Model WTP mobile power-supply unit for use in cars, trucks, tractors, and other vehicles, in conjunction



with the firm's WTS two-way field radiophone.

The power pack is designed to operate on either 6 or 12 volts. When it is installed in the vehicle, the portable radiophone is placed in connection with it; this automatically disconnects the radiophone dry batteries, so that all power is drawn from the vehicle battery. The result is a greatly increased communications distance, according to the manufacturer.

For further information write to the Morrow Radio Mfg. Co., Dept. C&E, 2794 Market St. N. E., Salem, Ore., or use the Request Card at page 18. Circle No. 109.

## Hardsurfacing electrode tough in zero weather

A new composite-coated hardsurfacing electrode, said to have exceptional toughness at low temperatures, is available from the Wall Colmonoy Corp.

Walmang No. 3 is easily deposited, operating equally well on either ac or dc reverse polarity. It is particularly well suited to such applications as crusher screens, shovel teeth, dredge parts, hammers, and other equipment subject to heavy wear.

For further information write to the Wall Colmonoy Corp., Dept. C&E, 19345 John R. St., Detroit 3, Mich., or use the Request Card at page 18. Circle No. 20.


**OMSTEEL Products Make Your CAT-built Tractors and Motor Graders MORE USEFUL!**

Your CAT-built Tractors and Motor Graders are only as useful and versatile as the auxiliary equipment available. OMSTEEL'S equipment for heavy and light snow removal, ripping and light dozing has been used around the world.

Auxiliary equipment shown is available through Caterpillar dealers, and is sold under the auxiliary equipment manufacturer's standard warranty.

**OMAHA STEEL WORKS**
**609 So. 48th St.**
**Omaha 6, Nebraska**

For more facts, use Request Card at page 18 and circle No. 317

**KEEP MAINTENANCE COSTS IN LINE**

*Prescription Filtration*

WIX Filter Cartridges are engineered specifically for every engine in construction service . . . gasoline or Diesel—mobile or stationary—for lube, fuel, and air.

CATERPILLAR • DETROIT DIESEL
INTERNATIONAL
LE TOURNEAU • MURPHY
ALLIS-CHALMERS
and ALL OTHER
Construction Equipment

**USE wix®**

**FILTER CARTRIDGES on ALL Your Engines!**

Let WIX *team-up* with your maintenance section to give you Prescription Filtration that stops costly engine failures and reduces construction equipment down time. WIX Lube, Fuel, and Air Filter Cartridges keep damaging dirt, grit, and sludge out of vital engine areas. Install WIX HEVI-DUTY Cartridges in *all* your filters for this money-saving trouble-free R filtration. They're made especially to stand up under tough operating conditions and work schedules.

WIX *teamwork* includes a FREE Filter Survey that lists every one of your engines with its correct lube, fuel, or air filter Cartridge replacement. And, your local WIX Wholesaler will stock a reserve supply of the particular Cartridges you need—one convenient source for fast filter service.

wix® FILTERS

Ask your Jobber, or write us—TODAY!

FREE . . . .

WIX CORPORATION • GASTONIA, N. C.
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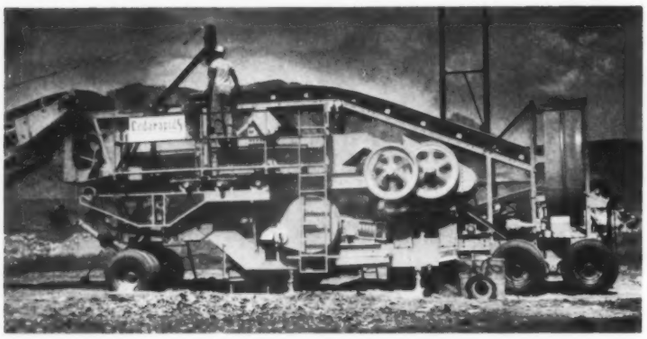


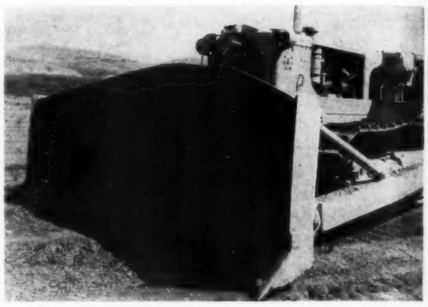
**The use of a high-speed 12 × 36-inch twin jaw crusher** for primary crushing is said to give the Iowa Mfg. Co.'s Challenger from 40 to 100 per cent greater primary capacity. The new Challenger can be fed from the front to produce 100 per cent crushed or fractured aggregate, or it can be fed from the rear when a high percentage of crush is not important. Screen decks can be arranged in six different ways to produce from one to four sizes of aggregate, ranging from 2-inch ballast down to ¼-inch-minus fines. For further information about this crushing plant, write to the **Iowa Mfg. Co.**, Dept. C&E, Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 60.

## Giant bulldozer offered for high-production work

The Shepherd Machinery Co. has available the Model M488 bulldozer for use with the Caterpillar D9 tractor.

Measuring 16 feet 11 inches wide and 6 feet 8 inches high, this U-type dozer is fabricated from T-1 steel for maximum strength with minimum weight.

For further information write to the Shepherd Machinery Co., Dept. C&E, P. O. Box 6789, East Los Angeles 22, Calif., or use the Request Card at page 18. Circle No. 7.



Designed for use with the Caterpillar D9 tractor, the M488 bulldozer's large dimensions permit maximum production in earthmoving.


'You Can Really Move the Stuff with a **KOLMAN!**

COMPLETELY PORTABLE MODEL 101 CONVEYOR-SCREEN PLANT

WHEN CONTRACTORS want to load and screen sand, gravel, crushed rock and other material in a hurry, there's just one answer. They turn to a KOLMAN. Owners and operators the world over agree — it takes a KOLMAN to really make those jobs pay out.

In less than a minute the 42" Model 101 loads out 20-ton trucks — the 36" loads out 15-ton trucks. And the KOLMANS keep up this pace under the severest operating conditions. Owners report a minimum of down time and operating expense.

This is a Conveyor

ORDINARY CONVEYOR

This is a **KOLMAN**

1, 2, or 3-Deck Vibrating Screen
Spray bars available
Conveyor, Power Unit, and Optional Accessories
Feeder-Trap Feeder-Hopper Doser-Trap or Casting-Hopper

COMPLETELY PORTABLE

The KOLMAN is available in belt widths from 18" to 48" and in lengths up to 60 feet. Their heavy construction is capable of carrying single, double or triple-deck vibrating screens without additional support. They can be equipped with a dozer trap or casting hopper, available with a built-in reciprocating plate feeder or apron feeder if desired. Adaptable to any type of feeding — dozer, dragline, shovel, front-end loader and others.

Write for literature and price lists now!

**SEND FOR FREE LITERATURE**

**Kolman Manufacturing Co.**
**4922 W. 12th St., Sioux Falls, S. D.**

Please send literature on
☐ 101 Heavy Duty Conveyors
☐ 202 Junior Conveyors
☐ 303 60" Loaders
☐ Feeders ☐ Screens ☐ Traps

Quote ..... size or ..... cap.

Name .....

Address .....

City .....

For more facts, use coupon, or Request Card at page 18 and circle No. 319

# LIMA Roadpacker speeds freeway construction near Colfax, California

Proper consolidation plays a large part in the speed with which McCammon-Wunderlich Co. and Wunderlich Contracting Co., Palo Alto, California, are completing their $3,650,000 state freeway contract on U.S. 40 east of Colfax.

These prominent contractors have been using the Lima Roadpacker, a big favorite for highway and airport construction throughout the country. It has no equal for fast, uniform consolidation by the vibratory method of single course macadam bases, gravel subbases and soil-cement bases.

The Roadpacker is equipped with six 420-lb. hydraulically driven shoes for effective vibrating and tamping action. These oscillate approximately ¼ in. at the right frequency for best consolidation of any base material. The force is applied vertically to prevent shoving the material being stabilized. The sole plate is designed for both forward and backward operation.

Working widths, easily varied by upfolding one or both of the end shoes, range from 8 ft., 9 in., with four shoes, to 13 ft., 1 in., with six shoes. The shoes are raised and lowered hydraulically.

*Get all the facts on the Lima Roadpacker— write today for your copy of the Roadpacker bulletin.*

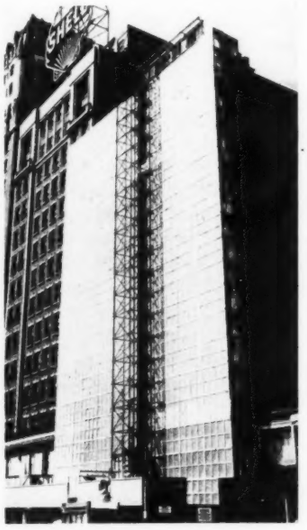
DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA** Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON
Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

For more facts, use Request Card at page 18 and circle No. 320

*To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.*

**Partly frozen material in a hopper-bottom railroad car** is quickly loosened and unloaded by means of the Hewitt-Robins car shakeout after the car has been preheated along the bottom for a few minutes to break the bond between car and material. The unit vibrates at a rate of 1,500 shock waves per minute and, according to the manufacturer, the shakeout does the job without the need for hand labor. For further information write to **Hewitt-Robins, Inc.**, Dept. C&E, 666 Glenbrook Road, Stamford, Conn., or use the Request Card at page 18. Circle No. 86.



**Brisk winds off Lake Michigan** didn't interfere with the remodeling of the 10-story IBM Building on Chicago's South Michigan Boulevard. The facade was protected by a clear covering of weather-resistant Visqueen polyethylene film while work proceeded inside. The plastic enclosure also kept falling construction materials from injuring passersby on the busy thoroughfare. For further information on Visqueen polyethylene film, write to the **Visking Co.**, Plastics Division, Dept. C&E, P. O. Box 1410, Terre Haute, Ind., or use the Request Card at page 18. Circle No. 118.


For EXTERNAL VIBRATORS
Specify McCARON BROS.

JETSHAKER
*Pneumatic External Vibrator*

unloading cement from Hopper car

**JETSHAKER Pneumatic EXTERNAL VIBRATOR FOR:**
Prestressed Concrete Forms and Screeds. Concrete Pipe Forms, Mine and Railroad Car Shakers, Vibratory Earth Compactors, Tunnel Forms, Bridge Piers, Concrete Piling, Platforms, Decks & PneuMekTrikals. Silos, Tanks, Bins, Hoppers.
**JETSHAKER** is a low maintenance pneumatic vibrator for external use, having only one moving part, an air jet driven rotary eccentric turbine of special bronze alloy. The only wearing parts are 2 ball bearings.
**JETSHAKER** exerts a force of 2600 lbs., 8,000 times per minute on all size forms. Air consumption is 25 to 40 c.f.m.'s @ 100 psi at unit.

Write for complete details
McCARON BROTHERS
14700 East Ramona Blvd.
Baldwin Park, California
or
JETSHAKER EASTERN
4239 Ridge Road, Cleveland 9, Ohio

For more facts, circle No. 321

# Roll on to Greater PROFITS

***Bring NOW-ness to Your Operations***
***Finance New Equipment through ASSOCIATES***

Every piece of equipment you operate should contribute to maximum profits! High maintenance and operating costs, impaired service, obsolescence, and fast depreciation . . . all knock the props out from under profits. About 50% of the nation's present business investment is being used for replacing obsolete or worn out equipment. A systematic program of equipment replacement and modernization is a must! This can best be accomplished through the proper kind of financing which allows you to add new equipment *when* it's needed . . . *without* depleting vital working funds.

Associates has an equipment financing plan with arrangements and terms fitted to your operating needs. A national network of over 200 Associates offices is ready to serve you. Ask your equipment dealer or contact your nearest Associates office for information on equipment financing.

**NOW** . . . expand and meet competitive situations by purchasing new equipment when it's needed.

**NOW** . . . benefit from the cost-saving advantages of new equipment . . . pay for it from additional profits.

**NOW** . . . make necessary additions and replacements without suddenly draining vital working funds.

**NOW** . . . enjoy greater operating efficiency; reduce maintenance and operating costs by updating and upgrading equipment.

**NOW** . . . take advantage of accelerated write-off methods of figuring depreciation in the financing of your equipment.

**SEND FOR YOUR FREE COPY TODAY!**
"Money to Grow On" is a new forty page book which explains the "mechanics" of equipment financing, fixed asset loans, advances for special situations and other Associates financing services.

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☐ Please send information on Associates financing:
Type of equipment_____
Name_____
Title_____ Company Name_____
Address_____
City_____ State_____

For more facts, use coupon, or Request Card at page 18 and circle No. 322

**A 35½-cubic-yard, 69,000-pound tri-tapered dragline bucket** is announced by the Electric Steel Foundry Co. The average width of the bucket is 11 feet 2 inches; height from the ground to arch, 13 feet 5 inches; and its over-all length is 18 feet 9 inches. It is specifically designed for use on a Marion Super 7800. For further information on this dragline bucket write to the **Electric Steel Foundry Co.**, Dept. C&E, 2141 N. W. 25th Ave., Portland 10, Ore., or use the Request Card at page 18. Circle No. 125.

## New troweling machine has sliding sheave clutch

A new troweling machine, the Model G34-4C Roto-Trowel, is announced by the Stow Mfg. Co.

Featured is a new sliding sheave-type clutch, with the clutch control lever on the machine's handle. When the operator releases the lever, blade rotation stops instantly. The unit's design is said to increase belt life considerably, as well as permit the engine to be started up at any throttle setting desired.

The G34-4C has a nonrotating, stationary guard ring, making it easy to work right up to walls and other obstructions. A knob on the handle adjusts the pitch of the blades while the machine is in motion.

The machine has a 2.5-hp engine, and is furnished complete with four 6×10-inch finish blades and four 8×10-inch float blades.

For further information write to the Stow Mfg. Co., Dept. C&E, 31 Shear St., Binghamton, N. Y., or use the card at page 18. Circle No. 30.

◄

## Cement batching plant offers high production

The Automaster-C, an automatic cement batch plant with a maximum capacity of 225 batches per hour, coupled with quick assembly and disassembly features, is available from the C. S. Johnson Co. Teamed with the recently introduced Automaster-A automatic aggregate batch plant, it is said to make a two-stop plant that will meet rigid weighing and recording specifications.

The new unit's elevated silo has a 390-barrel 1,560-cubic-foot capacity, and is arranged for one or two batchers.

One or two 14-cubic-foot 1,000-pound scale batchers have an individual capacity adequate for a 1½-cubic-yard paver batch. Cement weight is automatically rechecked after weighing, and increased if underweight. The discharge gate locks if the batch is overweight.

For further information write to the C. S. Johnson Co., Subsidiary of Koehring Co., Dept. C&E, P. O. Box 71, Champaign, Ill., or use the Request Card at page 18. Circle No. 31.


"THE SHEAVES THE THING"

Unretouched photograph. Section cut from a Flame-Hardened McKissick sheave . . . etched 2½ min. amonium persulfate.

CONSIDER:
Groove form . . . proper line support. Gently rounded lips prevent line chaffing when fleet angles etc. are present.

CONSIDER:
Completely machined grooving to proper line size. Always in perfect wind.

CONSIDER:
Dense martensitic structure. Clearly outlined by the $(NH_4)_2S_4O_8$ etch . . hard surface (450-500 Brinnel) in the wear area of the sheave. Always presents a smooth uncorrugated properly sized groove face.

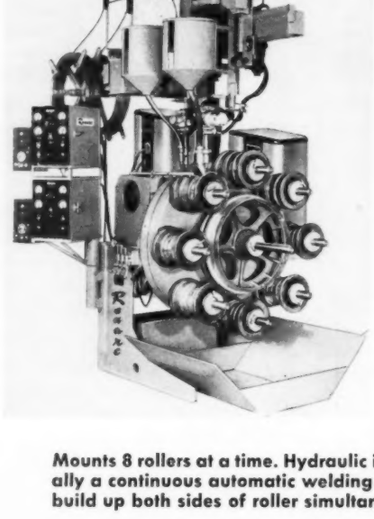
McKISSICK

McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

For more facts, use Request Card at page 18 and circle No. 323

REVOLUTIONARY *Rexarc*

*Enables High Speed Production in Tractor Roller Rebuilding*



**Here is the new *Rexarc* MS-8 Automatic Twin Head Roller and Idler Welder and Positioner that revolutionizes roller rebuilding. One operator can do as much high quality work as three to four men with other types of equipment.**

**Mounts 8 rollers at a time. Hydraulic indexing enables virtually a continuous automatic welding operation. Twin heads build up both sides of roller simultaneously.**

•

**Factory engineer trains your operator, assuring excellent results from the very beginning of welding operations, at no additional cost.**

•

***Write, wire or phone today for complete information about this revolutionary profit-maker.***

***Manufactured By***

THE SIGHT FEED GENERATOR COMPANY
SALES OFFICES AND FACTORY, WEST ALEXANDRIA, OHIO, U.S.A.

For more facts, use Request Card at page 18 and circle No. 324

The 35-ton-capacity Model BF5TX trailer is designed for moving shovels, cranes, blast-hole drills, and other equipment with high centers of gravity.

## Gooseneck trailer hauls tall, top-heavy machines

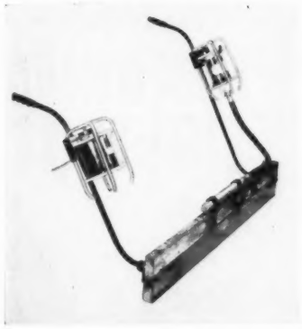
A new beam-type folding gooseneck trailer for hauling tall or top-heavy machinery is announced by the Hyster Co. Designated Model BF5TX, the unit has a 35-ton capacity and a standard 25-foot platform length.

With the folding gooseneck lowered, the hauled unit safely and easily straddles two low-slung main beams spaced 60 inches apart. Tracks travel on planks placed alongside the trailer, if necessary, so that the underside of the machinery will not drag on the trailer. When the equipment is in position, a winch on the truck tractor raises the gooseneck and trailer to the travel position on the fifth wheel.

Where overhead clearances present a problem, the gooseneck and winch allow the platform to be lowered.

For further information write to the Hyster Co., Martin Trailer Division, Dept. C&E, 620 Andrews Ave., Kewanee, Ill., or use the Request Card at page 18. Circle No. 107.

## Vibratory screed kit offers many features



Wyzenbeek & Staff, Inc., has available a new vibratory screed kit.

The unit employs a standard Wyco Junior vibrator; the 1⅜-inch-diameter vibrator head is attached to a 2×6 or 2×8 with two simple clamps, and the screed is moved over the concrete by means of two handles cushioned in rubber sockets. The vibrator motor is attached to one of the handles by a simple pin device, and the Wyco speed-control unit is attached to the other handle in the same way.

Screeds as short as 5 feet in length for sidewalk work and as long as 20 feet for slabs may be made up.

A typical application is its use in prestressed member fabrication, where the vibrator can be used when pouring the member and then used as a screed to strike off the top of the pour.

The unit is offered complete, but individual parts are also available.

For further information write to Wyzenbeek & Staff, Inc., Dept. C&E, 223 N. California Ave., Chicago 12, Ill., or use the Request Card at page 18. Circle No. 166.

## Tractor-seat suspension cushions road bumps

A new system of seat suspension, said to substantially increase operator comfort on the firm's wheel tractor-scraper units is offered by the Caterpillar Tractor Co.

Known as Torsionflex, the unit features three large-capacity resilient rubber torsion springs and a double-acting hydraulic shock absorber. In addition to cushioning the ride, the seat is also equipped with rubber snubbers to absorb shock if the seat should approach the maximum limit of its oscillation as a result of extreme haul-road bumps.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card that is bound in at page 18. Circle No. 112.

## Unit demounts big tires in matter of minutes

The Tiremaster, a unit especially designed for demounting off-highway tires, is offered by the Salsbury Corp.

Even the most tightly frozen tire can be demounted in 3 to 5 minutes with the Tiremaster, according to the manufacturer. The unit handles any tire from 15 to 25-inch rim diameter mounted on any flat base-type wheel. It is powered with a 2-hp electric motor, although gasoline-engine drive is also available.

For further information write to the Salsbury Corp., Dept. C&E, 1161 E. Florence Ave., Los Angeles 1, Calif., or use the Request Card at page 18. Circle No. 37.


# Reduce Weight with Voided Concrete Slabs

Middleville Road High School, Northport, L. I., N. Y.
Ellis Chingos Construction Corp., general contractors.
Severud, Elstad, & Kruger, structural engineers.
Ketcham, Gina & Sharp, architects.

*Form voids with low-cost*
**SONOCO**
**SONOVOID®**
**FIBRE TUBES**
*in concrete roof and floor slabs*

**See us at the A.S.C.E. Show**
•
**Booths 34-35**
•
**Statler-Hilton Hotel**
•
**Oct. 13-17, 1958**

The circular concrete roof slab for the library building of the Middleville High School weighs less because it is voided with SONOVOID Fibre Tubes.

Weight reduction is only one of the many advantages of voided concrete construction. Voided roof and floor slabs have smooth undersides to which paint or plaster can be applied without the necessity of constructing a dropped ceiling.

These and other features all add up to the fact that concrete members, voided with low-cost SONOVOID Fibre Tubes, save time, money and materials.

Use these tubes in bridge decks, floor, roof and lift slabs and in concrete piles . . . precast units or units cast in place.

Order in sizes from 2.25" O.D. to 36.9" O.D. Unless other lengths are specified, shipments will be made in standard 18' lengths. End closures available.

*See our catalog in Sweet's*

*For complete information and prices, write*

- HARTSVILLE, S. C.
- LA PUENTE, CALIF.
- MONTCLAIR, N. J.
- AKRON, INDIANA
- LONGVIEW, TEXAS
- ATLANTA, GA.
- BRANTFORD, ONT.
- MEXICO, D.F.

**SONOCO**
Construction Products
SONOCO PRODUCTS COMPANY
3096

For more facts, use Request Card at page 18 and circle No. 325

Now, for the first time, a practical, comparatively lightweight combination tripod-winch is available at reasonable cost—no need to use unsafe, makeshift rigs any longer.

# NEW! LUG-ALL® HIGH-EFFICIENCY
## COMBINATION TRIPOD-WINCH
### Capacity ¾ To 7½ Tons

**Features**

- Two speed operation allows maximum efficiency
- Side mounting of winch reduces lost headroom
- Direct drive permits quick take-up of cable
- Leg shields prevent sinking in soft ground
- Folds compactly for easy storage and transportation
- Lowers with crank and automatic brake or without crank with handbrake
- Adjustable legs to operate on uneven ground
- Crank securely locks into position—for your safety
- Locking pawl automatically falls into position when crank pressure is released.
- Extra long cables
- Simple overhead pulley arrangement
- Sturdy tubular steel construction
- Separate handbrake for lowering without crank

Quickly and easily set up, it will save you time and labor in lifting and lowering work where a suitable overhead for rigging a hoist is not available. The legs are movable for adjustability, easier handling and compact storage.

High mechanical efficiency and safety standards combined with long-wearing qualities are obtained with superior design and high grade materials and workmanship. This new unit has all the features you have ever wanted in this type of equipment.

FOR FURTHER INFORMATION WRITE TO
**THE LUG-ALL COMPANY • HAVERFORD 29, PA.**

For more facts, use Request Card at page 18 and circle No. 326

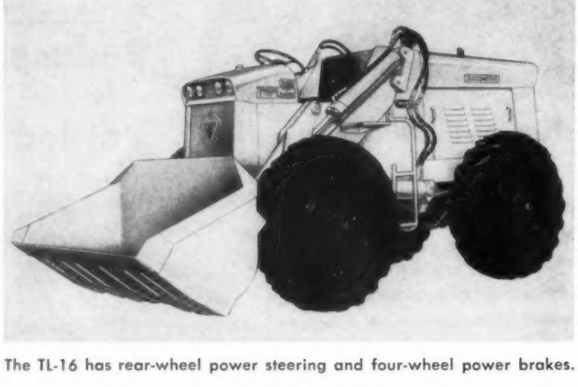
## Tool and utility boxes made for pickup trucks

A new series of tool and utility boxes, designed for simple installation on standard pick-up trucks, is announced by Reading Body Works, Inc.

Called Tool-Mates, the boxes are available in lengths of 78, 90, 96, and 108 inches. They have double-panel, watertight doors with recessed handles and slam-action cylinder locks.

Mounting brackets are furnished as standard equipment.

For further information write to Reading Body Works, Inc., Dept. C&E, 420 Gregg Ave., Reading, Pa., or use the card at page 18. Circle No. 44.



The TL-16 has rear-wheel power steering and four-wheel power brakes.

## New rubber-tire loader has 1¾-yard capacity

A new four-wheel-drive, 1¾-cubic-yard front-end loader is announced by the Tractomotive Corp.

Designated Tractoloader Model TL-16, the unit has a maximum lifting capacity of 14,000 pounds and a breakout force of up to 18,400 pounds.

For fast loading, the TL-16 bucket tips back 40 degrees at ground level, and for maximum stability while traveling, the bucket can be tipped back to an angle of 45 degrees when only 14 inches off the ground. Maximum dumping clearance under the hinge pin is 11 feet 6 inches. Under the bucket cutting edge, the dumping clearance is 9 feet 1 inch.

Power for the TL-16 is provided by either a Hercules 101-hp 6-cylinder gasoline engine or a 97-hp 6-cylinder diesel. The unit has a 3.5:1 torque converter and a 3-speed full-power shift transmission. All speeds, in both forward and reverse, are selected by a single lever. Top travel speed in either direction is 27 mph.

For further information write to the Tractomotive Corp., Dept. C&E, Deerfield, Ill., or use the Request Card at page 18. Circle No. 9.

## Ice-melting material causes less corrosion

The National Asphalt Corp. announces a new rust-inhibiting ice-melting material said to have 32 times greater thawing capacity than salt at 5 degrees F.

Known as Nacor Melts-It, it is made in the form of small balls, slightly larger than BB shot. Melting is accomplished by exothermic action (internal generation of heat). Corrosion is said to be greatly reduced.

For further information write to the National Asphalt Corp., Dept. C&E, Bulkley Bldg., Cleveland 15, Ohio, or use the Request Card at page 18. Circle No. 41.

Sikacrete Accelerating Densifier causes early set and quick strength development in both concrete and mortar — thus saving many costly hours of overtime finishing.

Sikacrete is a liquid admixture which enables you to place high quality concrete floors — despite cold weather.

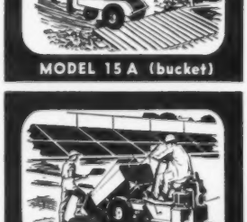
Moreover, Sikacrete gives you these big advantages: greater density, hard non-dusting surfaces, increased ultimate strength and reduced cracking. For complete information, write for Bulletin SI-57.

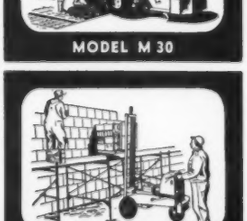
26-3

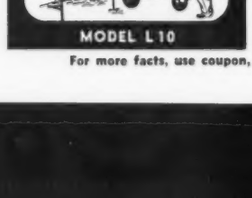
Sika SIKA CHEMICAL CORPORATION PASSAIC, NEW JERSEY

DISTRICT OFFICES: ATLANTA • BOSTON • CHICAGO • DALLAS • DETROIT • NEW ORLEANS • PHILADELPHIA • PITTSBURGH • SALT LAKE CITY • WASHINGTON—DEALERS IN PRINCIPAL CITIES—AFFILIATES AROUND THE WORLD

For more facts, circle No. 327




PRIME-MOVERS OPERATE PROFITABLY ON MORE JOBS

than any other powered buggy. Outside or under roof, Model 15A PRIME-MOVERS put your materials where you want them. Little or no preparation required as these units use same runways, ramps or hoists you now have. Triple output of labor with same manpower. Regardless of the stage of your job, you can show immediate profit in placing concrete, brick or tile with PRIME-MOVERS.

PRIME-MOVER

PRIME-MOVER CO., Muscatine, Iowa

Please send job reports, estimating data and literature on PRIME-MOVER equipment for:

CONCRETE PLACING ☐; Model____

BRICK HANDLING ☐; Model____

Name_____

Company_____

Address_____

For more facts, use coupon, or Request Card at page 18 and circle No. 328

To protect your light-load excavations, use the method that costs less, helps get your work done faster and safer.

Rent or Buy Foster's Lightweight Piling, the modern, easy-to-handle steel sheeting that gives you greatest strength, pound-for-pound of any lightweight piling. It can be driven by maul or with lightweight power hammers—without special rigs or tools. New design interlock cannot jam, locks rigidly when installed, yet can be pulled easily and re-used again and again on many jobs. Immediate shipments from Foster stocks in 10-gage, in both 12 and 15 inch laying widths.

Write or call your Foster office for Lightweight Piling Catalog No. CE10.

SINCE 1901

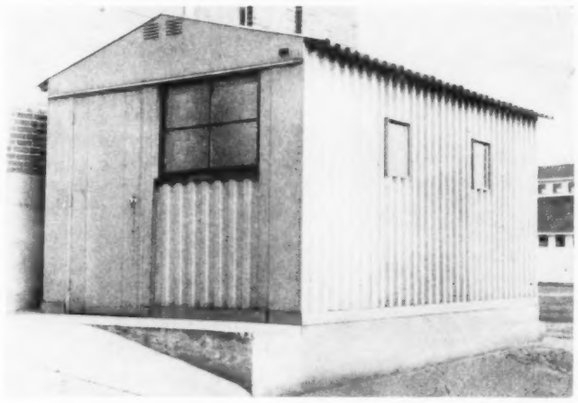
COMPLETE CONTRACTOR SERVICE

PILING • PIPE • RAIL • HIGHWAY PRODUCTS

L B FOSTER CO.

PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

For more facts, circle No. 329



The Handy-Hut has a basic length of 8 feet, and additional length in multiples of 2 feet can be obtained.

## Prefab huts are offered in three standard widths

The all-steel prefabricated Handy-Hut made by United Steel Fabricators, Inc., is now available in standard widths of 8, 10, and 12 feet.

With a basic length of 8 feet, additional length in multiples of 2 feet can be obtained. Side and end panels are offered with various arrangements of windows and doors to suit any use.

Special accessories available include the floor and skid assembly, roof ventilators, and window screens.

For further information write to United Steel Fabricators, Inc., Dept. C&E, Gasche St., Wooster, Ohio, or use the Request Card at page 18. Circle No. 59.

*To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.*

## Safety-hat liners for winter weather

The Gentex Corp. announces a full range of winter liners for use under safety hats at various cold-weather levels down to sub-zero temperatures.

All are completely free of metal, with nonconductive buttons, to eliminate electric-shock hazard. According to the manufacturer, they are snug-fitting, wrinkle-free, and completely washable.

For further information write to the Gentex Corp., Dept. C&E, Executive Offices, 450 Seventh Ave, New York, N. Y., or use the Request Card at page 18. Circle No. 124.


**SWENSON SPREADERS FOR ICE CONTROL**

*SPREADS SALT 200 LBS. PER MILE OR IN ANY DESIRED AMOUNT*

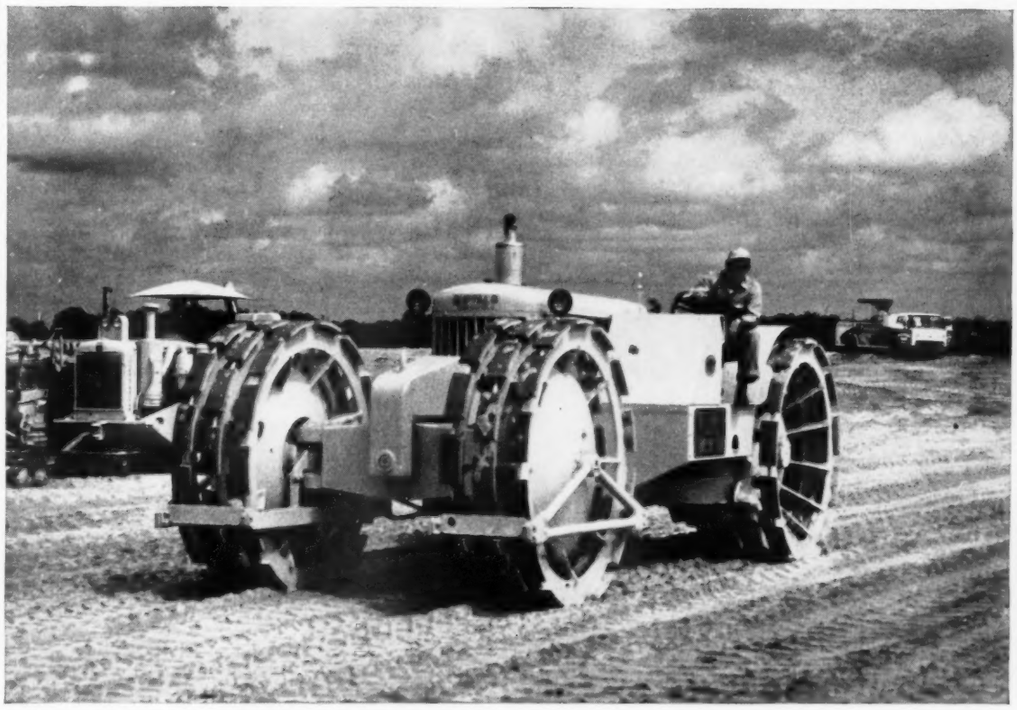
*Lays a Narrow Strip or Full Traffic Lane*

Handles all granular materials — salt, cinders, sand, calcium chloride, rock chips. Spreads at speeds up to 30 M.P.H. Clutch-controlled flow: steady or intermittent for hills and intersections.

*Write for complete information*

**SWENSON SPREADER & MFG. CO.**
LINDENWOOD, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 330


# Hyde and Cook's K-45 Kompactor* boosts daily compaction on 10-million cu. yd. job!

Few contractors ever have the compaction problem that faced Hyde Construction Co. and Cook Construction Co. when they started a $4-million naval air station job in July, 1957. The joint-venture contract called for approximately 10-million cu. yds. of earthwork just north of Meridian, Miss.

First, density specifications were rigid. Second, the soil was wet and predominantly sand, with some clay.

Third, the contract permitted 360 calendar days for completion, with $500-a-day penalty clause—and normally *only about 180 days a year can be worked in the area!*

With a vast array of conventional compaction equipment, the contractors were able to average 50,000 yards a day. This meant at least 200 working days would be required.

By mid-September, however, compaction had been increased to 65,000 yards a day—thanks, in a large part, to a Buffalo-Springfield® K-45 Kompactor roller put on the job.

Boosting production and meeting rigid specifications is nothing new for the self-propelled K-45 Kompactor . . . and here's why:

The K-45 operates on the "Interrupted Pressure Principle," which allows the machine to exert *all* its compaction effort *downward* . . . for uniform and maximum density . . . in the fewest possible passes. The K-45's staggered rows of heavy steel "pads" individually enter loose materials with a minimum of displacement either forward or sidewise . . . and then leave without disturbing the compacted areas in any way.

The Buffalo-Springfield K-45 Kompactor has proved itself as the top performer, the top money-maker for leading contractors throughout the country. Airfields, superhighways, military establishments—wherever the job is tough, specifications hard to meet and time short, you can count on the K-45 to do the job better . . . faster . . . *and at the lowest possible cost!*

See your Buffalo-Springfield Distributor today and get all the facts about the unusual Buffalo-Springfield K-45 Kompactor.

*TRADEMARK

**BUFFALO-SPRINGFIELD**
Roller Co. - Div. of Koehring Co.
SPRINGFIELD, OHIO

For more facts, use Request Card at page 18 and circle No. 331

**Coarse dry mixes of 3-inch aggregate and 1-inch or more slump** are rapidly vibrated by a Chicago Pneumatic Model CP-221 motor-in-head electric vibrator; the work requires only the vibrator itself to be up on the form. One-man-operated, the unit is connected by electric cable to a 180-cycle 230-volt gasoline-engine-driven generator located up to 200 feet away. The 2⅜-inch head gives up to 10,000 vibrations per minute. Standard equipment includes 25 feet of extension cord, a waterproof switch that may be totally immersed in concrete, plus hose handles that allow lowering 20 feet into the form. For further information write to the **Chicago Pneumatic Tool Co.**, Dept. C&E, 8 E. 44th St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 88.

## New slackline bucket offered in three sizes

A new slackline cableway bucket is available from Sauerman Bros.

The Slackliner features lighter weight for a given strength, and reportedly requires less line pull than many other buckets of the same rated capacity. It has a continuously curved cutting edge designed to quickly penetrate hard digging material and move it into the bucket with minimum resistance. This curve also gives more tension in the cutting edge and much less bending stress, the company states.

The new bucket is a complete

## Aluminum drum-heater is electrically powered

A new electrically powered drum-heater, for melting drums of various fluid materials such as tars and pitches, is announced by the Glas-Col Apparatus Co.

Built of aluminum, the heater is light and easy to handle. It need only

be lowered over the drum that is to be heated, and three leads hooked up.

Three circuits provide zone heating, each circuit covering a third of the height of the drum. One, two, or three of the zones may be used, depending on the level of the liquid in the drum.

For further information write to the Glas-Col Apparatus Co., Dept. C&E, 711 Hulman St., Terre Haute, Ind., or use the Request Card at page 18. Circle No. 16.

## Diamond blade announced for early joint-sawing

For early joint-sawing, the Champion Mfg. Co. offers its new Model C-60 tungsten carbide diamond blade.

The high concentration of diamonds in its tungsten carbide bond permits the blade to cut softer and highly abrasive aggregates without sacrificing blade life, according to the company.

For further information write to the Champion Mfg. Co., Dept. C&E, 2028 Washington Ave., St. Louis 3, Mo., or use the Request Card at page 18. Circle No. 89.


# NEWS about a bigger-than-ever Koe

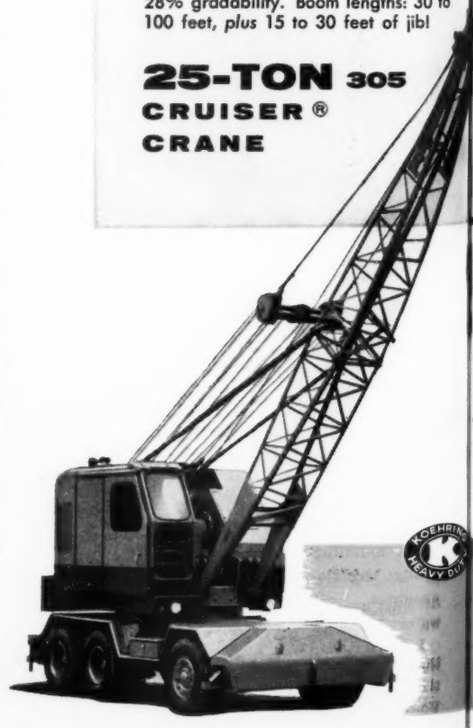
**Presenting... 2 NEW CRANES**

**35-TON 435 TRUCK CRANE**

Big, heavy-duty . . . with plenty of load stability on or off-pavement . . . new Koehring® 435 truck crane safely lifts up to 35 tons, with 40-foot boom *at 15-foot radius* (based on 85% rating). Removable counterweight, boom, outriggers reduce weight well within highway load-limits

Now, meet the new 3-axle 305 Cruiser (below) . . . one-man operated, self-powered 25-ton crane, *with travel speeds up to 18 mph* . . . smooth torque-converter drive . . . automotive type power-steering . . . short 27 ft.-9¾ in. turning radius . . . 28% gradability. Boom lengths: 30 to 100 feet, *plus* 15 to 30 feet of jib!

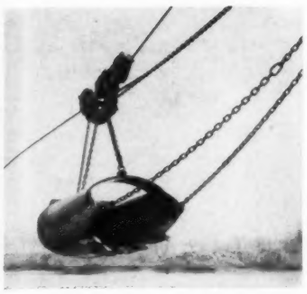
**25-TON 305 CRUISER® CRANE**



**Quick facts on KOEHRING WORK CAPACITY:**

| MODEL | TYPE OF MOUNTING | CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.) | |
|---|---|---|---|
| ON RUBBER | | | |
| 205 | 3-axle truck, or 21.5 mph Cruiser | 30,000 lbs. | at 12-ft. radius |
| 305 | 3-axle truck, or 18 mph Cruiser | 50,000 lbs. | at 12-ft. radius |
| 435 | 4-axle truck | 70,000 lbs. | at 15-ft. radius |
| 545 | 4-axle truck | 90,000 lbs. | at 15-ft. radius |
| ON CRAWLERS | Size shovel | CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.) | |
| 205 | ½ Cu. Yd. | 20,000 lbs. | at 10-ft. radius |
| 305 | ¾ Cu. Yd. | 30,000 lbs. | at 12-ft. radius |
| 405 | 1 Cu. Yd. | 40,000 lbs. | at 12-ft. radius |
| 545 | (Crane only—85% rating) | 90,000 lbs. | at 12-ft. radius |
| 605 | 1½ Cu. Yds. | 72,300 lbs. | at 12-ft. radius |
| 805 | 2 Cu. Yds. | 104,200 lbs. | at 12-ft. radius |
| 1205 | 3 Cu. Yds. | 190,000 lbs. | at 12-ft. radius |

*Extra lift capacity means . . .* **MORE WORK CAPACITY WITH ALL ATTACHMENTS**



welded assembly. It is offered in capacities of 1, 1½, and 2 cubic yards.

For further information write to Sauerman Bros., Inc., Dept. C-34, Dept. C&E, 620 S. 28th Ave., Bellwood, Ill., or use the Request Card at page 18. Circle No. 33.

**For cold-weather concrete curing** on this new highway bridge on Route 29, near Washington, D. C., the Empire Construction Co., of Baltimore, employed a Herman Nelson Thrifty portable air heater. One of four available models, the Thrifty is an indirect-fired unit. By this principle products of combustion are separated from the warm-air stream. When the heater is used indoors, any fumes or smoke are safely vented away. Flexible canvas ducts give utilization of heat with minimum waste, according to the manufacturer. For further information write to the **American Air Filter Co.**, Dept. C&E, 217 Central Ave., Louisville, Ky., or use the Request Card at page 18. Circle No. 143.


# Koehring fleet.....ON RUBBER

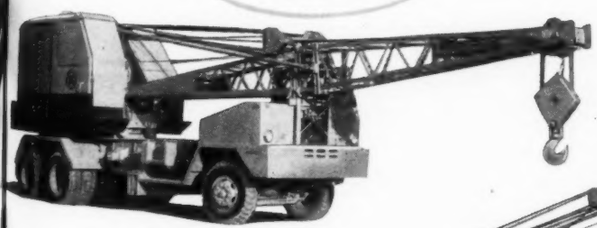
**15-TON**
**205 TRUCK CRANE**

Travel is unrestricted on Koehring 205 truck crane. Overall width, only 8 feet. Axle-load distribution meets highway regulations in most areas, even when carrying 25-foot boom over steering end. Work capacities: 15-ton crane, ½ to ¾-yd. clamshell or dragline, ½-yd. shovel, hoe.

One man controls all operations . . . one engine supplies all power for work-and-travel on Koehring 205 Cruiser (below). It drives job-to-job at *21.5 mph* (highway travel unrestricted). There's torque-converter on 4-wheel drive, automotive power-steering, 27½-foot turn radius, 30% gradability. Koehring 205 Cruiser has all standard attachments: clamshell, dragline, shovel, hoe.

**15-TON**
**205 CRUISER CRANE**

**25-TON**
**305 TRUCK CRANE**



Here's another heavy-duty, high-reach crane worth looking into . . . a truck-mounted 305, that raises up to 100 feet of main boom (or 130-foot boom-and-jib) *with low A-frame!* It's a 25-ton capacity crane with clamshell, dragline, shovel, hoe versatility.

**45-TON**
**545 TRUCK CRANE**

With this big, truck-mounted *545*, Koehring now brings you *45 tons* of lift capacity . . . *plus* quick conversion from fully-equipped machine to roadable machine.

K829

***Pick the size that suits YOU . . . then call Koehring distributor today for a demonstration.***

**KOEHRING DIVISION OF KOEHRING COMPANY**
**Milwaukee 16, Wisconsin**
**Koehring excavators and cranes also manufactured in: CANADA • ENGLAND • SPAIN • JAPAN**

For more facts, use Request Card at page 18 and circle No. 332


## Heavy-duty lift-hoist performs many functions

A heavy-duty, portable winch-hoist, said to be exceptionally versatile in its application, is offered by the Indus Corp.

Designated Multi-Pul, the unit lifts, lowers, and pulls; can be mounted in any position; and is safe and easy to operate, the manufacturer reports. It is available in two models: the S-100 single reel, weighing approximately 23 pounds, and the T-100 twin reel, which weighs about 33 pounds. Both units have a load rating of 6,000 pounds, double-rigged.

For further information write to the Indus Corp., Dept. C&E, 1815 Madison Ave., Indianapolis 25, Ind., or use the Request Card at page 18. Circle No. 131.

## Bituminous distributor features tow-type design

The Model RMT tow-type, trailer-mounted maintenance unit for heating and applying bitumen is available from the Rosco Mfg. Co.

It operates by spraying through a detachable 4-foot spraybar or through a hand spray hose. A gravity draw-off directly from the tank is for filling hand pots.

One lever controls pressure for spraybar or hand spraying. The pump is protected against excessive pressure by an automatic relief valve.

For further information write to the Rosco Mfg. Co., Dept. C&E, 3118 Snelling Ave., Minneapolis 6, Minn., or use the Request Card at page 18. Circle No. 27.

**Keeping the operator comfortable** in cold weather is a function of this cab mounted on the Davis backhoe. A large window area affords maximum visibility and eliminates any blind spots. The Davis cab rotates with the movement of the backhoe so that the operator always faces his work. The sides and doors are easily removed for warm-weather operation. For further information write to the **Massey-Ferguson Industrial Division,** Dept. C&E, 1009 S. West St., Wichita, Kans., or use the Request Card at page 18. Circle No. 133.

## Device measures air entrained in concrete

A testing device said to simplify the application of Boyle's Law for the precise determination of the air entrained in concrete is offered by the Techkote Co., Inc.

According to the company, with the Precision Air Meter there is no

necessity for adjustment due to changes in barometric pressure, and the reading is direct. The entire test can be performed quickly and easily by one person.

The meters are light in weight, and are available in ¼ and ½-cubic-foot models. They are supplied complete with aluminum carrying case and tamping rod, straightedge, syringe, and nomograph.

For further information write to the Techkote Co., Inc., Dept. C&E, 600 Lairport St., El Segundo, Calif., or use the Request Card at page 18. Circle No. 164.

*To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.*

CYANAMID EXPLOSIVES

HELP YOU MAKE EVERY LOAD A PAYLOAD

This load may be "fill" or maybe it's "waste." But one thing you can count on: it's a PAY LOAD when Cyanamid Explosives are on the job!

That's because any blast *engineered* with high-quality Cyanamid Explosives gives you maximum blasting efficiency . . . and at the same time assures fragmentation that is sized for easy, economical shovel production.

This is practical, hard-hitting economy—the kind that makes every load a pay load and puts dollars and cents into your pocket. Why not get complete details today? Just call your Cyanamid Representative, or write to

CYANAMID

AMERICAN CYANAMID COMPANY
Explosives and Mining Chemicals Department
30 Rockefeller Plaza, New York 20, New York

DISTRICT SALES OFFICES: St. Louis, Missouri • New York City, New York • Latrobe, Pennsylvania • Pottsville, Pennsylvania • Scranton, Pennsylvania Dallas, Texas • Salt Lake City, Utah • Bluefield, West Virginia. THE CYANAMID LINE: High Explosives • Permissibles, • Seismograph Explosives Blasting Agents • Blasting Powder • Blasting Caps • Electric Blasting Caps • Blasting Accessories.

For more facts, use Request Card at page 18 and circle No. 333



FOUNDATION CONSTRUCTION

CAISSONS

DRILLED AND UNDERREAMED

PIERS

SPECIAL DRILLING PROBLEMS

Offices in Atlanta, Ga., Pittsburgh, Pa., Washington, D.C., Cleveland, Ohio

Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

McKINNEY DRILLING COMPANY

NACOGDOCHES, TEXAS

Ph.: LOgan 4-8373 • P. O. Box 190

For more facts, circle No. 334

The powerful new addition to the Oliver line of tractors is shown working with the company's new Model 998 1½-cubic-yard loader.

## Powerful new tractor has torque converter

The Model 995 GM Lugmatic diesel tractor, heaviest and most powerful wheel tractor produced by the firm, is available from The Oliver Corp.

The 995 features an automatic torque converter said to increase pull power of the 90-hp machine by more than 100 per cent.

Other features include rubber-spring seats to "float" bumps and power steering as special equipment.

For further information write to The Oliver Corp., Dept. C&E, 400 W. Madison St., Chicago, Ill., or use the card at page 18. Circle No. 66.

## New bulk-cement plants hold 29 to 413 barrels

Engineered Equipment, Inc., announces its Corgal bulk-cement plant, offered in capacities from 29 to 413 barrels.

Featured in these bulk-cement set-ups is a new line of Corgal silos said to combine lightweight and high-strength characteristics. The silos have a heavy galvanized coating, and a complete set of aeration fittings is supplied to condition the cement for proper flow.

The plants are available in various combinations with UD Series elevators, BD screw conveyors, and manual or automatic batchers.

For further information write to Engineered Equipment, Inc., Dept. C&E, 1001 Linden Ave., Waterloo, Iowa, or use the Request Card at page 18. Circle No. 49.

The Corgal bulk-cement plants are offered in various combinations with UD Series elevators, BD screw conveyors, and either manual or automatic batchers.


**IT's NEW --- The Campbell Sliding Cab**

*for the models HU, HH, and HO*

**"Payloaders"!!!**

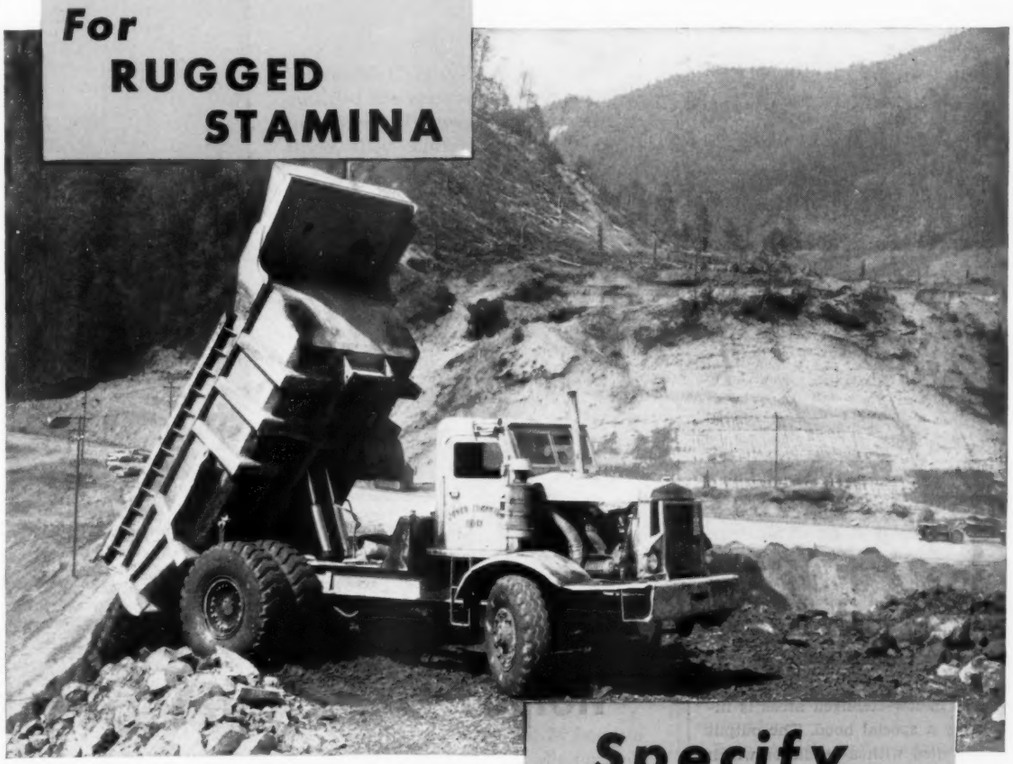
This sturdy, modern design offers features long desired by "PAYLOADER" operators, among them—Sliding top, ball bearing mounted on steel channel—Rubber seals to insure weather tightness—Permanently mounted access ladder —Rear view mirror—Tinted safety glass windshield and skylight.

*Investigate* this completely new design in "Payloader" Cabs by calling your "Payloader" distributor, or contact

**CAMPBELL DETACHABLE CAB CO.**
**WAUCONDA, ILLINOIS**

For more facts, use Request Card at page 18 and circle No. 335

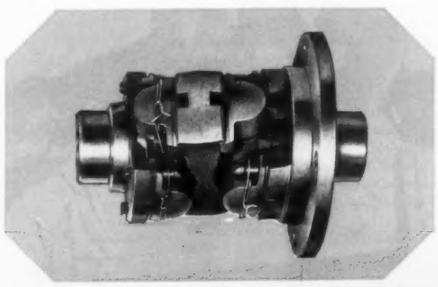
**For RUGGED STAMINA**



**Specify MECHANICS *Roller Bearing* UNIVERSAL JOINTS**

For Cars, Trucks, Tractors, Farm Implements, Road Machinery, Industrial Equipment, Aircraft

Manufacturers of the big diesel transports, that must stand up under hour-after-hour of gruelling service, have learned to rely upon MECHANICS Roller Bearing UNIVERSAL JOINTS to deliver hundreds of thousands of miles of trouble-free service. Because MECHANICS JOINTS drive through KEYS—instead of bolts—they stand up under punishment that shears off other types of fasteners. They are designed with less parts and connections for easy assembly and servicing—smooth running balance—maximum strength with less weight—and long, trouble-free, safe operation. Rugged stamina is just one of the advantages you get when you specify MECHANICS Roller Bearing UNIVERSAL JOINTS. Let MECHANICS engineers help you design this and other competitive sales features into your product's transmission train.



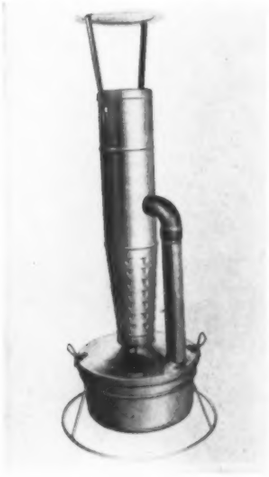
**MECHANICS UNIVERSAL JOINT DIVISION**
Borg-Warner • 2030 Harrison Ave., Rockford, Ill.
Export Sales: Borg-Warner International
36 So. Wabash, Chicago 3, Illinois

For more facts, use Request Card at page 18 and circle No. 336

**Drainage operations handled from start to finish with a single tractor** is claimed for either the Trojan Model 104 or 154 tractor shovel, when equipped with the Ottawa Model LX backhoe. The Model 104 is 1¼-yard unit, and the 154 has a 2-yard capacity. Besides excavating, pipelaying, backfilling, and tamping in drainage work, this backhoe-loader combination is also capable of excavating for foundations and loading the material into dump trucks or stockpiling it for future backfilling operations. The Model LX backhoe has a continuous 190-degree swing without adjustments, digs to a 12½-foot depth, and loads into trucks with sideboards as high as 8½ feet. For further information write to the Trojan Division, **The Yale & Towne Mfg. Co.**, Dept. C&E, Clinton St., Batavia, N. Y., or use the Request Card at page 18. Circle No. 32.

## Full combustion insured by new-type salamander

C. R. Daniels, Inc., announces a new type of salamander called the Penguin. The unit features an outside return pipe that draws off the inert gases, soot, and unburned material,



and returns them to the flame, insuring complete combustion without soot or waste.

The Penguin is easily lighted with a match, and a damper is provided for positive extinguishing. Diffusion of heat in low-ceilinged areas is insured by a special hood. The output is controlled with a regulator which accurately determines the size of fire in the stack.

The salamander stands 63 inches high and weighs 28 pounds.

For further information write to C. R. Daniels, Inc., Dept. C&E, Daniels, Md., or use the Request Card at page 18. Circle No. 113.

## Motor starting fluid also inhibits corrosion

SureFire motor starting fluid, designed to provide fast, safe starting for all gasoline and diesel engines, even at temperatures as low as 65 degrees below zero, is offered by the Wilco Co.

This new, improved formula offers a low-ether-content starting fluid which supplies smooth, positive starts without excessive detonation, according to the manufacturer. The fluid is also said to inhibit engine corrosion.

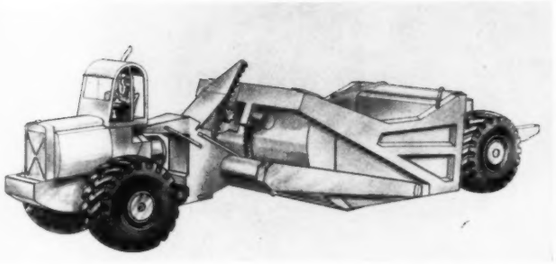
For further information write to the Wilco Co., Dept. C&E, 4425 Bandini Blvd., Los Angeles, Calif., or use the card at page 18. Circle No. 54.

Jack Hartrick (left) and Chuck Daub (right) go over lubrication and fuel deliveries with W. D. Dillon, one of the joint venture project principals. Chuck Daub is a Standard lubrication engineer. Like Hartrick, Daub has an engineering degree plus special training for this work.

# STANDARD OIL service helped this contractor on the Illinois Toll Highway

*McCarthy-Mass-Dillon learn about Standard Oil service while building an $11-million segment of the Illinois Toll Highway*

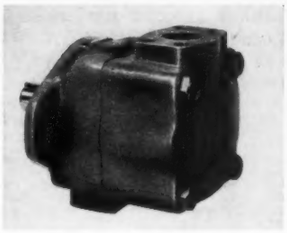
John Peters, purchasing agent and office manager, goes over order for supplies with Jack Hartrick. In addition to experience and training for working with contractors on jobs like this, Jack has completed the Standard Oil Sales Engineering School.



**Scrapers with capacities** of 50 and 100 cubic yards are announced by R. G. LeTourneau, Inc. The new machines, in the 70 and 125-ton class, feature individual electric motors geared directly to the inner rim of each wheel, to provide greater traction and working power under the payload. Power is supplied by a 600-hp diesel-electric dynamo. For further information write to **R. G. LeTourneau, Inc.**, Dept. C&E, 2399 S. MacArthur, Longview, Texas, or use the Request Card at page 18. Circle No. 110.

## New hydraulic pumps start easily in cold

A new line of mobile hydraulic pumps for construction and material-handling equipment, designed to place a minimum starting load on the



engine, is announced by Vickers, Inc.

The pumps also feature replaceable pumping cartridge construction. The pump need not be dismounted from the machine. Instead, cover bolts are removed and a new pumping cartridge (which consists of all wearing parts) inserted. The cartridges are available in kit form.

The pumps are offered in two sizes: the Series 25 with SAE rating of 12, 14, and 17 gpm, and the Series 35 with SAE rating of 21, 25, and 30 gpm. Both pumps will operate at speeds up to 2,000 rpm.

For further information write to Vickers, Inc., Dept. C&E, P. O. Box 302, Detroit 32, Mich., or use the Request Card that is bound in at page 18. Circle No. 70.

## Direct-drive chain saws offer several features

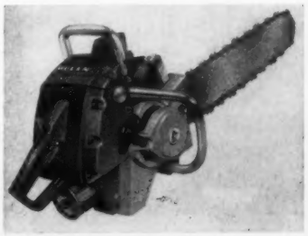
Two new direct-drive chain saws, designated Series 3800 and 3900, are announced by the Bolens Products Division of the Food Machinery & Chemical Corp.

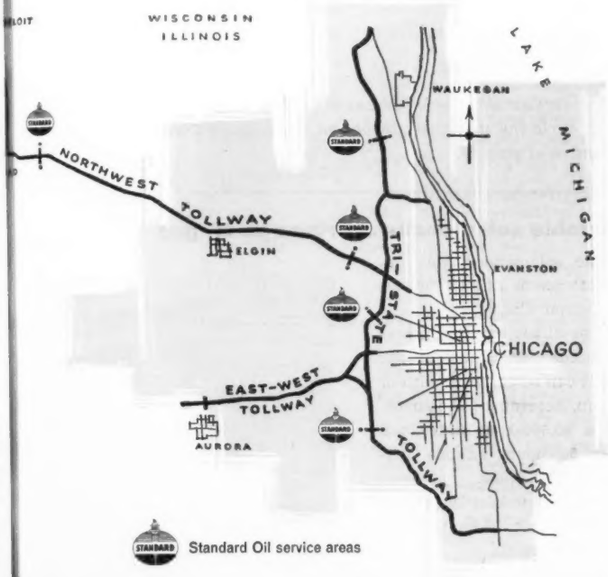
The 3900 Series saw is equipped with an all-position, fuel pump carburetor, and the 3800 model has an antiflooding, simplified diaphragm carburetor.

Both models are available with guide bars ranging up to 24 inches and feature "pivot-point" balance, thumbtip oiler for positive bar and chain lubrication, automatic clutch, multiposition handles, and rewind starter.

They are powered with 4.7-cubic-inch-displacement engines, and each weighs approximately 21 pounds, less bar and chain.

For further information write to the Bolens Products Division, Food Machinery & Chemical Corp., Dept. C&E, 215 South Park, Port Washington, Wis., or use the Request Card that is bound in at page 18. Circle No. 39.




When McCarthy-Mass-Dillon was awarded the contract for 17.2 miles of the Illinois Tollway west of the Fox River, they contracted with Standard Oil for petroleum products. Here's what happened:

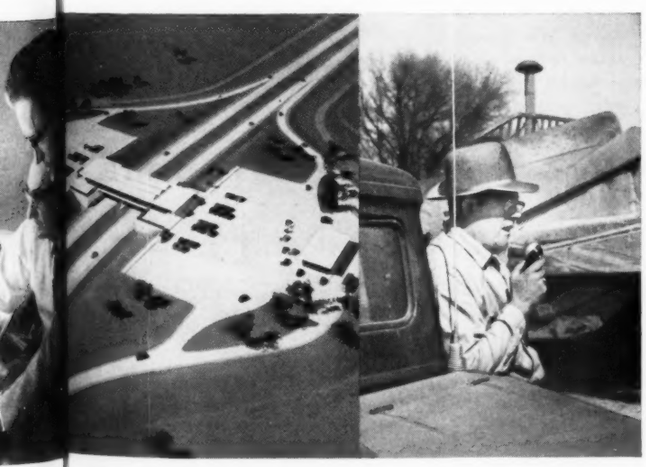
1. Jack Hartrick, a Standard Oil lubrication specialist with a degree in engineering and 11 years' selling experience with Standard, was assigned to the project. He surveyed equipment and recommended lubricating oils, greases and fuels.

2. Products able to provide lubrication over a wide range of applications plus competent recommendations by a man trained for this work resulted in the contractor having to maintain only a minimum investment in inventories. Storage and application facilities were likewise kept to a minimum.

3. Motor oil, diesel fuel and gasoline were delivered to the site from supply stations at Huntley and Rochelle, each of which is only a few miles away.

Both facilities were on call 24 hours a day. Equipment was never idle for lack of supplies of petroleum products.

This kind of service added up to money saved for the contractor. You can get this kind of service on your construction job anywhere in the 15 Midwest and Rocky Mountain states serviced by Standard. Find out how. Call the Standard Oil office nearest you. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**



Model of Standard Oil service plaza on Illinois Tollway. Five such units will provide service from both sides of the highway. Air conditioned, over-the-roadway restaurant will give guests an interesting view of the Tollway.

Getting the message. Howard Leonard talks to headquarters from site of Tollway interchange with Highway 31. Leonard supervises more than 150 pieces of equipment on the job—all of it lubricated by Standard Oil products.

Two motor oils, three greases and two fuels make up most of the inventory of petroleum products on the McCarthy-Mass-Dillon job. Here's the list:

**STANOLUBE HD-M Motor Oil**
**STANOLUBE Series 3 Motor Oil**
**RYKON Grease**
**AMOCO Lithium Multi-Purpose Grease**
**CALUMET Viscous Lubricant**
**STANOLIND Diesel Fuel**
**STANDARD RED CROWN Gasoline**

STANDARD Asphalt is used by the contractor on all shoulder construction.

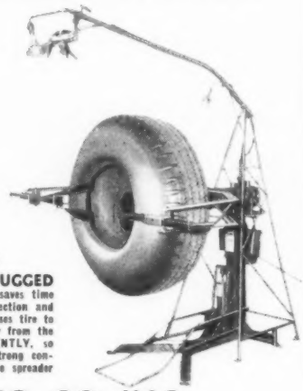
*You expect more from* **STANDARD** *and get it!*

HEAVY TRUCK TIRES HANDLED
QUICKLY-EASILY THRU 14.00-24" 20 PLY
BRANICK
HEAVY-DUTY
"EF-ERT-LESS"
TIRE SPREADER

BUILT TO SPREAD THE HEAVY PLY AND WIRE CORD TIRES FOR . . .

- INSPECTION
- REPAIRING
- INSTALLING & REMOVING

TUBES — FLAPS — AIR BAGS — INSIDE CURING RIMS



POWERFUL • TIME & LABOR SAVER • RUGGED

The NEW powerful heavy-duty "Ef-ert-less" Tire Spreader saves time as it LIFTS—CLUTCHES—SPREADS heavier tires for inspection and repair in seconds. A real labor saver, the HEAVY DUTY raises tire to spreader arms, by tire lift and air valve control. The power from the large cylinder spreads entire casing wide open CONVENIENTLY, so entire casing is FREE to revolve while spread. Branick's strong construction and quality features provide you with the best tire spreader made.

BRANICK MFG. CO. INC.
FARGO BOX 1937 NO. DAKOTA

For more facts, use Request Card at page 18 and circle No. 338

Spotting Sewer Pipe with Pin-Point Accuracy!

UNIT provides ample power maneuvers easily

Here is the ideal crane for placing pipe exactly where you want it...and placing it FAST. This sturdy, dependable machine provides easy maneuverability, plus precision-steadiness. The safety-promoting FULL VISION CAB gives the operator an unobstructed view of the entire operation, at all times. Makes pipe-positioning more efficient, safer, more profitable to all concerned. On other jobs, too, UNIT is equally satisfactory. It will pay you to investigate.

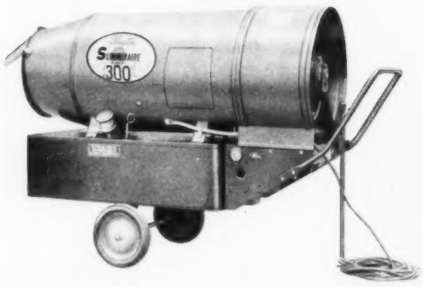
UNIT Models are available in ½ or ¾ yard Excavators...Cranes up to 40 tons capacity... Crawler or Mobile type...Gasoline or Diesel. All models convertible to all attachments.

UNIT CRANE & SHOVEL CORP.
6309 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

Geared for Maximum Lifting Job

For more facts, use Request Card at page 18 and circle No. 339





## Portable space heaters offered in three models

The Clayton Mfg. Co. offers the Series 300 Summeraire portable space heaters.

Available in three models—electric drive, oil-fired; electric drive, oil-fired, plus thermostatic control; and gasoline-engine drive, oil-fired—the units are said to deliver 2,400 cubic feet of clean, odorless, heated air per minute. Maximum Btu output ranges as high as 375,000 per hour.

For further information write to the Clayton Mfg. Co., Dept. C&E, P. O. Box 550, El Monte, Calif., or use the Request Card at page 18. Circle No. 128.

*For further information on any product described in this section, circle the indicated number on the Request Card that is bound in at page 18.*

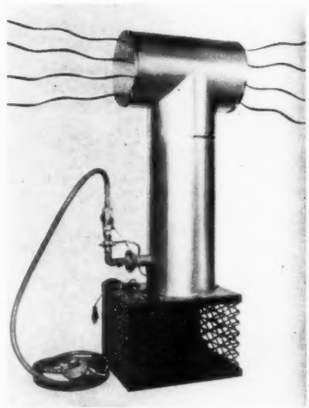
## New portable salamander operates on LP gas

A portable salamander that operates on LP gas is offered by the Flamegas Detroit Corp.

Designed to direct the heat wherever it is needed, at a rate of 950 cfm, the unit can be operated with or without a fan. According to the manufacturer, a 40,000-Btu heater will operate for 50 hours on one 100-pound cylinder of LP gas.

This salamander weighs 29 pounds, and is 43 inches high, 16 inches wide, and 11 inches in depth.

For further information write to the Flamegas Detroit Corp., Dept. C&E, 12901 Auburn Ave., Detroit 23, Mich., or use the Request Card at page 18. Circle No. 21.



Save money on track repairs

Twin Track-o-matic
RAIL REBUILDER

Don't let track maintenance and new parts costs eat into your profits. With properly rebuilt rails you can obtain 75 to 100% additional life from a set of tractor rails. Track-o-Matic rebuilds both rail surfaces simultaneously, automatically. One man can rebuild a large tractor rail in less than 8 hours. Welding table can be tilted to any desired angle so that rail edges can also be built up if necessary.

Machine is easily adjustable to all sizes of tractor rails. Simple construction, easily operated, completely automatic. Equipment distributors too, will find this a profitable unit.

MULTI-MATIC TRACK ROLLER REBUILDER

Also available, automatic track roller rebuilder in various sizes.

*Send for complete details on both these profit saving machines.*

AUTOMATIC WELDING CO.
AIRPORT ROAD
WAUKESHA, WISCONSIN • U.S.A.

For more facts, use Request Card at page 18 and circle No. 340

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# Product LITERATURE

*To obtain free copies of any of the literature described in the following section, circle the designated number on the Request Card at page 18.*

**Winter concreting**—a folder discussing the benefits of Solvay calcium chloride in overcoming the effects of low temperatures on concrete. According to the literature, Solvay calcium chloride in the concrete mix produces quick setting, early strength, and added protection against freezing.

Write to the Solvay Process Division, Allied Chemical & Dye Corp., Dept. C&E, 61 Broadway, New York 6, N. Y., or use the Request Card at page 18. Circle No. 15.

**Watertight masonry**—a bulletin discussing the important elements involved in the design and specification of watertight masonry. Outlines six important considerations, including the use of Omicron mortarproofing in aiding both workmanship and watertightness. Bulletin OM-8A.

Write to The Master Builders Co., Dept. C&E, 7016 Euclid Ave., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 144.

**Portable batch plant**—a booklet describing the Conveyco portable 5½-yard batch plant. According to the literature, the plant can be erected in one work shift, and four trailer loads get the entire batch plant on the road. Illustrated with photographs and dimensional drawings.

Write to The Conveyor Co., Dept. C&E, 3260 E. Slauson Ave., Los Angeles 58, Calif., or use the Request Card at page 18. Circle No. 58.

**Drilling equipment**—a catalog containing illustrations and specifications of Truco portable diamond drilling equipment and accessories. On-the-job photos and descriptions of particularly difficult drilling situations.

Write to the Truco Masonry Drilling Division, Wheel Trueing Tool Co., Dept. C&E, 3200–53 W. Davison Ave., Detroit 38, Mich., or use the Request Card at page 18. Circle No. 149.

**Winter pavement maintenance**—an illustrated booklet on bare pavement maintenance with straight Sterling rock salt. Describes the effect of the salt on ice and snow. Includes tips on the organization of effective winter road maintenance. Information on storage.

Write to the International Salt Co., Inc., Dept. C&E, Spruce and Adams Sts., Scranton, Pa., or use the Request Card at page 18. Circle No. 12.

**Testing equipment**—a bulletin covering 32 new pieces of test apparatus for soils, concrete, and asphalt. Includes descriptions of the Right-A-Weigh balance, the basic concrete tester, a new 200-ton pile loading ram, a concrete air indicator, and precision air-entrainment meters.

Write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 22.

**Removable gooseneck**—a bulletin on the Smithco removable gooseneck with self-contained hydraulic system. Available in tandem tubular, tandem trunnion, and trunnion axle models, in capacities from 20 to 100 tons, according to the literature. Photographs; specifications.

Write to L. B. Smith, Inc., Smithco Trailer Division, Dept. C&E, Camp Hill, Pa., or use the Request Card at page 18. Circle No. 29.

**Steel sheeting**—an illustrated booklet on Armco steel sheeting for trenches, cofferdams, cutoff walls, and shore protection. Discusses two types—flange and interlocking sheeting; gives physical properties and driving data; and describes typical jobs. Also includes a method of figuring size and spacing of wales and struts. Form SH-4658.

Write to Armco Drainage & Metal Products, Inc., Dept. C&E, 703 Curtis St., Middletown, Ohio, or use the Request Card at page 18. Circle No. 36.

**Hydraulic jacks, pullers**—a generously illustrated catalog describing Simplex hydraulic jacks and pullers. Features standard jacks; Jenny center-hole pullers; Rol-Toe foot-lift jacks; Re-Mo-Trol jacks and pullers; push-pull and two and three-grip pullers. Specifications; data on accessories.

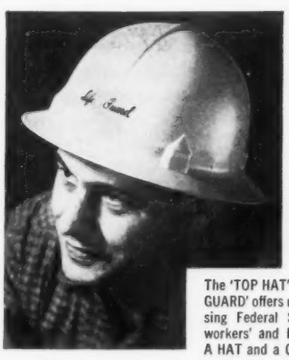
Write to Templeton, Kenly & Co., Dept. C&E, 16th St. and Gardner Road, Broadview, Ill., or use the Request Card at page 18. Circle No. 115.

**Powder-actuated fasteners**—a booklet on the use of Ramset powder-actuated tools in highway construction. Explains how the tools can be used in fastening concrete forms used in the construction of bridges, and in anchoring curb forms for highways. Also covers fastening of conduit, concrete ties, and drainage pipes and gutters.

Write to Ramset Fastening System, Dept. B-126, Olin Mathieson Chemical Corp., Dept. C&E, 12117 Berea

Jackson FIBER GLASS HATS and CAPS surpass all Federal tests for construction workers' safety hats. In eight standard colors, others in quantities.

COMBINATIONS of Safety Caps available with welding helmets, goggles, face shields.



The 'TOP HAT' for Safety . . . Jackson's 'LIFE GUARD' offers unequaled protection by surpassing Federal Specifications for construction workers' and Edison Institute tests as well. A HAT and a CAP in white, yellow, and grey.

The Jackson 'ALUMIHAT' complies with Federal Specifications except electrical resistance. Heat-treated aluminum, with soft satin finish.

**tops**

**• TOPS IN COMFORT**

To men who wear safety hats all day long, comfort is important. Jackson hats and caps fit well and bear smoothly and evenly on the head.

See how little it takes to fit the headband to clearly marked hat sizes. And, being easy to fit, men will fit these hats accurately, so they stay on better in windy weather. Chin straps and winterliners are also available.

The polyethylene headband is smooth and flexible, yet firm enough to hold its shape. A soft-backed leatherette sweatband fits all around.

**• TOPS IN STYLE**

They protect without looking bulky and have a well designed, uncluttered look. Easy to clean, they keep their shiny, smooth finish.

**• TOPS IN SAFETY**

Thorough comparative testing against published industry-accepted standards proved that Jackson's three types of safety hats, each in its own class, offer an extra margin of safety. They should be your choice.

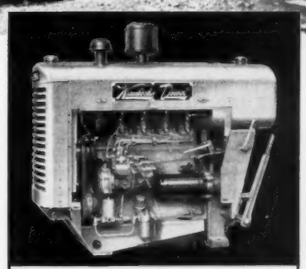
**Jackson Products**

AIR REDUCTION SALES CO., A DIVISION OF AIR REDUCTION CO., INC.

31739 Mound Road, Warren, Michigan

Sold through Welding Supply and Safety Dealers

For more facts, use Request Card at page 18 and circle No. 341



Powerful Waukesha Utility Four—Model 180-DLCU Diesel—four cylinder, 3½-in. bore x 3¾-in. stroke, 144 cu. in. displacement, counterbalanced crankshaft.

REICH *drills* either way

ROTARY or DOWN-THE-HOLE with

**WAUKESHA** *Diesel* **POWER**

The *small* rig that's designed for down-the-hole tool drilling of holes up to 6½-in. diam. in hard rock—the Waukesha Diesel-powered, Model C-250 Reich Drill is said to be the only machine of its kind in the world. It does the work of small hard rock rigs that drill with drifters; and large hard rock machines that drill with down-the-hole tools. But the Reich is only half the size . . . and half the cost . . . of large machines. The makers, Reich Bros. Mfg. Co., Terre Haute, Ind., gave the drill an equally versatile power unit. The Waukesha 180-DLCU has special Diesel design characteristics including the patented spherical combustion chamber which gives lively responsive acceleration, smoothness of operation, and clean burning with high economies both of maintenance and fuel. Get the details of Waukesha dependability in Bulletin 1627.

**WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN**

NEW YORK TULSA LOS ANGELES 399

For more facts, use Request Card at page 18 and circle No. 342

Road, Cleveland 11, Ohio, or use the Request Card at page 18. Circle No. 24.

**Utility tractors**—a pictorial review of the Allis-Chalmers D Series utility tractor line. Stresses versatility with on-the-job photographs of various attachments in action. Covers design and construction features of the tractors, with specifications included. Catalog UT-103.

Write to the Allis-Chalmers Mfg. Co., Dept. C&E, P. O. Box 512, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 94.

**Drafting supplies**—a 48-page catalog on the extensive Warren-Knight line of engineering equipment and supplies. Well illustrated with photographs and drawings.

Write to the Warren-Knight Co., Dept. C&E, 136 N. 12th St., Philadelphia 7, Pa., or use the Request Card at page 18. Circle No. 140.

**Utility spray tank**—a bulletin on the redesigned Littleford Model 101 utility spray tank for bituminous work. Gives complete specifications and is illustrated with photographs. Bulletin JJ-5.

Write to Littleford Bros., Inc., Dept. C&E, 453 E. Pearl St., Cincinnati 2, Ohio, or use the Request Card at page 18. Circle No. 64.

**Starting-fluid applicator**—literature on the Spray Instnstart starting-fluid applicator for diesel and gasoline engines. Also presents data on the benefits of Spray starting fluid in winter weather.

Write to the Spray Products Corp., Dept. C&E, P. O. Box 844, Camden 1, N. J., or use the Request Card at page 18. Circle No. 43.

**Chainless power saw**—literature describing the improved Wright Super Rebel reciprocating-blade power saw. Stresses the unit's versatility and the safety factor in its chainless design. Illustrated with photographs and drawings. Complete specifications.

Write to the Wright Power Saw & Tool Corp., subsidiary of Thomas Industries, Inc., Dept. C&E, 410 S. Third St., Louisville 2, Ky., or use the Request Card at page 18. Circle No. 96.

**Round-column molds**—a folder describing DesLauriers steel forms for round columns. Details the advantages of round-column design, and of steel molds. Specification data; sketches; photos of completed jobs. Also contains information on Econ-O-mold single-use forms.

Write to the DesLauriers Column Mould Co., Inc., Dept. C&E, 5036 W. Lake St., Chicago 44, Ill., or use the Request Card at page 18. Circle No. 148.

**Soil-sampling core barrel**—a bulletin describing the Acker Denison core barrel for obtaining undisturbed samples from sand, hard clays, silt, and other difficult cohesive soil conditions. Illustrations include a cutaway drawing that shows in detail how the unit operates. Parts list. Bulletin 1100.

Write to the Acker Drill Co., Inc., Dept. C&E, P. O. Box 830, Scranton 2, Pa., or use the Request Card at page 18. Circle No. 71.

**Concrete groover, joint cleaner**—literature on the Windsor concrete groover and joint-cleaning machine. Details the unit's wide application in cement or bituminous concrete, and gives data on method of operation.

Write to the Windsor Machinery Corp., Dept. C&E, 85 Grassmere Ave., Elmwood 10, Conn., or use the Request Card at page 18. Circle No. 65.

**Portable diamond drill**—a brochure on the Winkie portable, one-man-operated diamond drill. Action photos stress the fast setup of the 200-foot-capacity unit, as well as its ability to drill at any angle.

Write to the Wink Corp., Dept. C&E, 12710 W. Robin Lane, Brookfield (Milw.), Wis., or use the Request Card at page 18. Circle No. 132.

**Concrete forms**—"How to Save 30 Per Cent Plus on Concrete Forms and Finishing Costs", a folder discussing the benefits of Simpson high-density overlaid plywood for concrete forms. Lists such features as longer form life; clean, quick stripping; and reduced maintenance. Specifications included.

Write to the Simpson Logging Co., Dept. C&E, 1032 White Bldg., Seattle, Wash., or use the Request Card at page 18. Circle No. 84.

**Scales**—literature describing the Hydroscale, for use in weighing objects suspended from crane hooks. Available in capacities from 500 to 200,000 pounds, according to the brochure. Photographs; specifications.

Write to Hydroway Scales, Inc., Dept. C&E, P. O. Box 531, Oak Ridge Station, Royal Oak, Mich., or use the Request Card at page 18. Circle No. 34.

**Front-end loader**—a brochure on the improved Model HP Scoopmobile, a machine said to load wet or dry materials at a rate of more than 2 yards per minute. Illustrated with drawings, photographs.

Write to Mixermobile Mfrs., Inc., Dept. C&E, 8027 N. E. Killingsworth St., Portland 20, Ore., or use the Request Card at page 18. Circle No. 99.

**Reversible material spreader**—literature detailing the benefits of the Shunk reversible, all-purpose material spreader. According to the brochure, the machine can spread either in front of or behind the rear wheels. Close-up photos of major components; full views of mechanically driven, hydraulically driven, and dump-bed-mounted models.

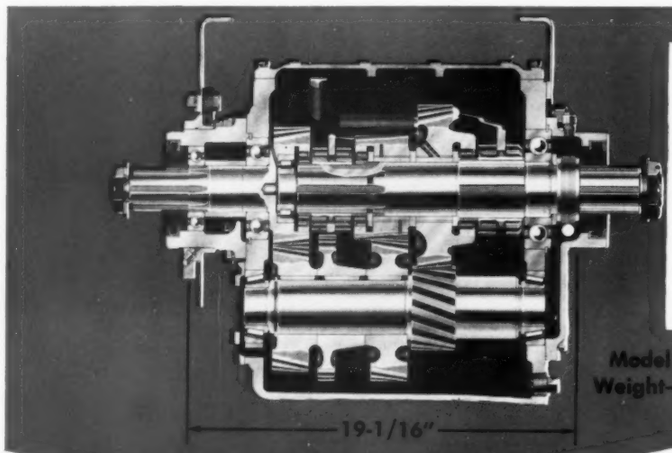
Write to the Shunk Mfg. Co., Dept. C&E, Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 117.

**Tools**—a 156-page industrial tool catalog covering hand tools for assembly, maintenance, field service, and original equipment repair kits. Includes a complete range of automotive tools and shop equipment for truck fleets. Illustrations; specifications.

Write to the Snap-on Tools Corp., Dept. C&E, 8028 28th Ave., Kenosha, Wis., or use the Request Card at page 18. Circle No. 146.

**Rock ripper**—complete specifications and application data on the Double J Breaker rock ripper. Explains operation of the tool's breaker plate, a ripping device which works on the same principle as a log-splitting wedge. Drawings and action photographs.

Write to the Double J Breaker Co., Inc., Dept. C&E, 3484 E. Gage Ave., Bell, Calif., or use the Request Card at page 18. Circle No. 150.


Model 3-A-65
Weight—270 lbs.

| Model No. | 3-A-65 |
|---|---|
| Gear | Ratio |
| High | .754 |
| Intermediate | 1.00 |
| Low | 2.221 |

Now

# 3-speed AUXILIARY TR

The Fuller Manufacturing Company now offers the most complete line of three-speed auxiliary transmissions . . . for transport, logging, construction, mining and crane carrier services . . . at lower prices than competitive units in a comparative capacity range.

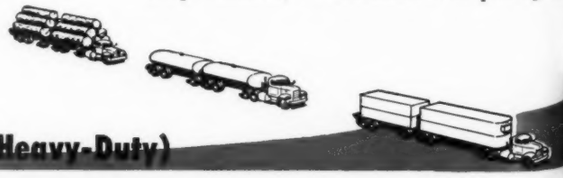
The extremely rugged heavy-duty 92 Series has been completed by the addition of 5 new sets of gear ratios, Models 3-D-92 through 3-H-92. Four new sets of gear ratios, Models 3-E-65 through 3-H-65, have been added to the popular medium heavy-duty 65 Series.

**Split Gears and GO**

The expanded line of three-speed auxiliary units in cludes splitting ratios, both underdrive and overdri With these splitting ratios, the engine can operate maximum horsepower through a full range of vehi speeds. Ideal for over-highway operation, the extra ge allow faster schedules, greater profits.

**Deep Reductions**

Deep reductions, in combination with splitting ratio



92 SERIES (Heavy-Duty)

| Model No. | 3-A-92 | 3-B-92 | 3-C-92 | 3-D-92 | 3-E-92 | 3-F-92 |
|---|---|---|---|---|---|---|
| Gear | Ratio | Ratio | Ratio | Ratio | Ratio | Ratio |
| High | .74 | .84 | .75 | .75 | .84 | .84 |
| Intermediate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Low | 2.09 | 1.24 | 2.64 | 1.24 | 2.09 | 2.64 |

FULLER MANUFACTURING COMPANY (Subsidiary, Eaton Manufactu

**Blueprint files**—an illustrated brochure on Momar's line of Glider blueprint files. Explains the "glide-action" filing and withdrawal of standard 100-sheet clamp-type plan holders. Four basic rack-types are presented.

Write to Momar Industries, Dept. C&E, 4323 W. 32nd St., Chicago 23, Ill., or use the Request Card at page 18. Circle No. 154.

**Rubber-tire loader**—a fact sheet on Wagner rubber-tire front-end loaders in capacities of 5 cubic yards or larger. Contains complete specifications on an 8-cubic-yard model, and is illustrated with a dimensional drawing. Brief data on optional accessories and attachments.

Write to Wagner Tractor, Inc., Dept. C&E, 8027 N.E. Killingsworth, Portland 20, Ore., or use the Request Card that is bound in at page 18. Circle No. 141.

**Forming equipment**—a brochure on the Universal line of concrete forming equipment. Presented in construction-magazine format, complete with new-product section and well illustrated job stories.

Write to the Universal Form Clamp Co., Dept. C&E, 1238 N. Kostner Ave., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 102.

**Continuous-mix asphalt plant**—a bulletin describing Barber-Greene's new Model 847 continuous-mix asphalt-plant series, rated variously from 110 to 300 tph. Describes each plant component in detail and illustrates its theory of operation and field function with photographs and drawings. Special coverage on the aggregate feed systems.

Write to the Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 73.

**Concrete-cutting tool**—a folder describing the Oxweld ACL-3 Powder Lance, a tool said to be capable of slicing through concrete or metal of any thickness. Describes cost-saving applications on construction and demolition jobs. Complete specifications. Form 1153.

Write to the Linde Co., Division of Union Carbide Corp., Dept. C&E, 30 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 63.

**Versatile concrete paver**—a bulletin on the Rex Slip-Form concrete paver. Action photos show how the machine performs all the functions of a typical multi-machine finishing train. Bulletin No. 58169.

Write to the Chain Belt Co., Construction Machinery Section, Dept. C&E, 4701 W. Greenfield Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 104.

**Asphalt additive**—literature on Kling-HS-Beta, an additive for asphalt cements. Among benefits claimed are that it increases bonding effectiveness of the asphalt to the aggregate; allows hydrophilic aggregates to be employed which otherwise would be rejected; lowers maintenance cost.

Write to the Lancaster Chemical Corp., Dept. C&E, Broad and 13th St., Carlstadt, N. J., or use the Request Card at page 18. Circle No. 145.

**Semiautomatic welder**—a brochure describing the Colmonoy semiautomatic welder. Points out and illustrates important construction features of the new welder, and lists typical applications. Tube wires available for use with the Colmonoy unit also described.

Write to the Wall Colmonoy Corp., Dept. C&E, 19345 John R. St., Detroit 3, Mich., or use the Request Card at page 18. Circle No. 151.

**Earthmoving equipment**—a brochure describing the entire Euclid line of earthmoving equipment. Describes and illustrates 24 different models. Condensed specifications included. Form 326R.

Write to the Euclid Division, General Motors Corp., Dept. C&E, 1361 Chardon Road, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 2.

**Calcium chloride**—a leaflet describing the success of the Ohio Turnpike maintenance department in using bulk calcium chloride. Explains how the Ohio Turnpike Commission has stored calcium chloride outside under tarpaulins for extended periods prior to use with abrasives or by itself for ice control.

Write to the Calcium Chloride Institute, Dept. C&E, 909 Ring Bldg., Washington 6, D. C., or use the Request Card at page 18. Circle No. 5.

**Wire-line spooling**—a well illustrated 122-page handbook containing useful facts about wire-line spooling in general and Lebus counterbalanced spooling in particular. Covers proper use, precautions, and tolerances. Also gives complete installation procedures for each method of Lebus grooving. Typical application data.

Write to Lebus International Engineers, Inc., Dept. C&E, Longview, Texas, or use the Request Card at page 18. Circle No. 13.

**Bituminous plants**—a folder describing eight Iowa Mfg. Co. bituminous plants. Includes five stationary-type models ranging in capacity from 30 to 240 tph, and three portable types with capacities from 90 to 240 tph. Details major components. Heavy emphasis on automation features. Photographs; cutaway drawings.

Write to the Iowa Mfg. Co., Dept. C&E, Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 51.

**Concrete-paving spreader**—a newly revised bulletin on the Blaw-Knox concrete-paving spreader. Contains 16 pages of on-the-job pictures, spreader operation diagrams, and a job-tested paving method. Also highlights the spreader's automatic transverse blade and vibratory paving attachment. Bulletin No. 2485R.

Write to the Sales Promotion Department, Construction Equipment, Blaw-Knox Co., Dept. C&E, 40 Charleston Ave., Mattoon, Ill., or use the Request Card at page 18. Circle No. 90.

**Pipeline auger**—literature on the Moorlane self-powered, portable, hydraulic-feed pipeline auger, said to bore holes for pipe sizes from 2 to 10 inches. According to the brochure, the unit can be positioned in a bell hole and anchored, ready for boring, within a few minutes. Operation detailed with photos.

Write to the Moorlane Co., Dept. C&E, 409 E. Archer St., Tulsa 1, Okla., or use the Request Card at page 18. Circle No. 134.


S SERIES (Medium Heavy-Duty)

| 3-B-65 | 3-C-65 | 3-D-65 | 3-E-65 | 3-F-65 | 3-G-65 | 3-H-65 |
|---|---|---|---|---|---|---|
| Ratio | Ratio | Ratio | Ratio | Ratio | Ratio | Ratio |
| .804 | .754 | .804 | .804 | .754 | 1.00 | 1.00 |
| 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.32 | 1.32 |
| 1.239 | 1.239 | 2.221 | 1.74 | 1.74 | 2.221 | 1.74 |

...the most complete line of

TRANSMISSIONS

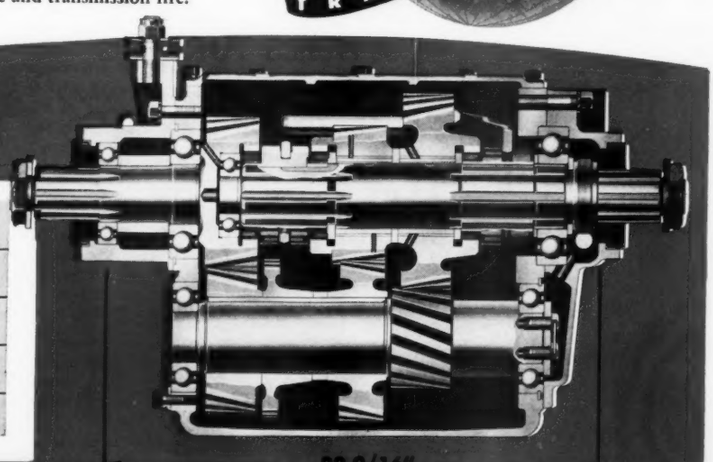
offer maximum flexibility both on and off-highway where the deep reduction is required for extreme grades and soft footing, and where splitting efficiency is required for traffic conditions.

**Longer Equipment Life**

With engines working in the most efficient torque and horsepower range, there is less lugging . . . less wear . . . and greater fuel economy. Result: lower maintenance costs, less downtime, longer engine and transmission life.

Fuller TRANSMISSIONS ®

Model 3-A-92
Weight—350 lbs.




| 3-G-92 | 3-H-92 |
|---|---|
| Ratio | Ratio |
| 1.00 | 1.00 |
| 1.327 | 1.327 |
| 2.09 | 2.64 |

pany) Transmission Division · KALAMAZOO 13F, MICHIGAN · U.S.A.

For more facts, use Request Card at page 18 and circle No. 343

Leading the variety of compaction equipment on the runway at Grand Forks AFB, Grand Forks, N. Dak., is a Buffalo-Springfield Kompactor that compacts the grade.

After the base-course material is spread, a Seaman-Andwall Trav-L-Plant tills the material, adding water whenever necessary. Base-course work was done in two 11-hour shifts daily.

# Swift base-course work leads way for high-production airfield paving

Production and placing of some 1½ million tons of base course was the key to successful concrete paving of the enlarged runway at Grand Forks Air Force Base near Grand Forks, N. Dak.

Making it possible for the day shift to place 5,000 cubic yards of concrete were two 11-hour shifts, which hustled to crush, haul, and put down some 12,000 tons of base course a day.

As many as 25 big trailer dumps shuttled the ten miles between the crushing plant and the airstrip to place the gravel. The contractor, Western Contracting Corp., Sioux City, Iowa, had to take special care to insure uniformity and the proper compaction of the 16 to 24-inch base course.

Rotary tillers blended and added moisture to the mixture. Vibrating rollers and shoe-type vibrators compacted the material to the specified 100 per cent.

With the base course in place, the path was clear for the mammoth paving operation. To get the total of 380,000 cubic yards of concrete laid, Western generally kept six paving machines shooting concrete to the forms. The hungry pavers ate up 100 railroad carloads of aggregate, 20 carloads of cement, and one-half million gallons of water each day.

### Work enlarged

The size of the airstrip and supporting facilities has greatly increased since S. J. Groves & Sons started the original grading and paving contract in December, 1955. At that time, the Air Defense Command required only a 100×7,500-foot runway to accommodate its planes. When it was decided in 1956 that the Strategic Air Command should take over the base, a much larger runway was required to handle the heavier planes. The new runway added 200 feet to the original 100-foot width and extended the length to 12,350 feet. This length was further increased by two 1,000-foot asphalt-surfaced overrun sections at each end of the strip.

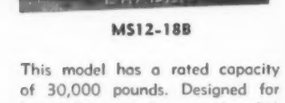
The project, under the supervision of the Omaha District of the U. S. Army Corps of Engineers, had about eight million dollars' worth of con-


BRADEN

The Truck Winch with BUILT-IN Safety Features

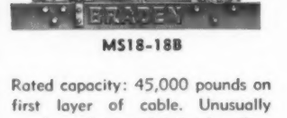
BRADEN truck winches have built in safety features that are so important to any operator. The finest materials and workmanship assure maximum performance when you need it most. Rated capacities are established with high safety factors to assure safety during overloads. The BRADEN Oil Cooled, Fully Adjustable, Automatic Safety Brake is the best in the business, so any load can be kept under perfect control at all times.

See your nearest BRADEN dealer for complete information.



MS12-18B

This model has a rated capacity of 30,000 pounds. Designed for heavy-duty trucking and other tasks requiring the movement of loads between 10 and 15 tons.



MS18-18B

Rated capacity: 45,000 pounds on first layer of cable. Unusually sturdy and powerful for handling heavy equipment of all types with complete safety.

*Write for Catalog*

BRADEN WINCH COMPANY
P. O. Box 547, Broken Arrow, Oklahoma

BRADEN Winches

*In service around the world*

For more facts, use Request Card at page 18 and circle No. 344

Bulk material haulers

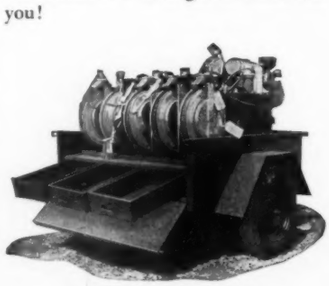
WE TURN WHEELS...

designing and building whatever type rubber-mounted field service equipment you need — mounted on the truck of your choice

Special-purpose workshop

TO KEEP YOUR WHEELS TURNING

Use our engineering facilities, design know-how and experience to help meet *your* problems. Just pin this ad to your letterhead . . . we'll get in touch with you!



Small, two-wheel lubeunit

Medium-size work shop

CEMCO INDUSTRIES, Inc. GALION, OHIO

For more facts, use Request Card at page 18 and circle No. 345

The mixed material is then compacted by a pair of Vibro-Plus Terrapac rollers vibrated by Waukesha diesel engines and pulled by a Cat DW10 tractor.

This Lima Roadpacker with six vibrating shoes was particularly valuable in compacting the top lift, since it worked without displacing the surface.

***12,000 tons of base course is put down each day to make ground for 5,000 cubic yards of concrete***

struction completed late last year, and some 27 million dollars' worth under way on SAGE facilities, hydrant fueling systems, a jet test cell, navigational aid facilities, housing, and numerous other items necessary for a modern air force base.

Western Contracting Corp. was awarded the largest of these contracts—the $11.7 million job of grading and paving to complete the runway, and the building of additional aprons and taxiways.

In order to get most of the work done during the 1957 construction season, Western had grading, base-course operations, and paving often going on at the same time on different sections of the airfield. Getting down below the frost line was the main object of the extensive grading; any frost-susceptible material within six feet of the top of the concrete had to be taken out.

Although the thickness of the various layers of subbase, base, and pavement varied with their position in the runway, a typical section, starting from the bottom, consists of 34 inches of non-frost-susceptible material (this sometimes had to be hauled in), 4 inches of granular filter (same material as base course), 15 inches of rigid base course, and 19 inches of concrete. The combined thickness of the filter blanket and the base course always equaled the thickness of the concrete, which reached a maximum of 24 inches.

**Base-course operation**

In this region where clay soil is predominant, Western had to go ten miles south to find suitable base-course material. At the site, the contractor set up two portable screening and crushing plants designed to meet the requirements of this particular job.

Working one pit was a plant containing two 3-deck Simplicity screens and a Nordberg 4-foot cone crusher. Working the other pit was a portable plant containing one Simplicity 3-deck screen and a Nordberg 4-foot cone crusher for the oversize. Both plants produced from 10,000 to 12,000 tons of minus 1-inch material per 22-hour day.

To keep pace with this production, about 25 International trucks with Daybrook hydraulic-dump trailers trundled their loads from the plant to the airstrip. The material was spread in 6-inch lifts by a Jersey

*(Continued on next page)*


**4 in 1**

**3 in 1**

**2 in 1**

**GASOLINE ENGINE DRIVEN WELDER/POWER PLANTS**

| FIREBALL AMPERAGE RANGES | |
|---|---|
| METALLIC | INERT GAS |
| 35-100 AC | 35-75 AC |
| 65-160 AC | 65-160 AC |
| 110-400 AC | 150-375 AC |
| 35-80 DC | 35-100 DC |
| 75-175 DC | 85-225 DC |
| 125-350 DC | 170-375 DC |

**DAH-350 FIREBALL** four-in-one model is the only complete unit made to incorporate an ac-dc welder for (1) metallic arc, or (2) tungsten inert gas welding, plus (3) ac power plant, and (4) 1 KW dc power while welding. Twelve separate amperage ranges as shown above. Additional standard equipment features include a polarity switch, either continuous or "start only" high frequency and an automatic inert gas control panel with solenoid valve and postflow timer. Rated output at 100% duty cycle: 250 amps dc tungsten arc; 300 amps ac tungsten arc. Generator: 10 KW of 115/230v, single phase, 60 cycle ac.

**DA-300 BIG RIG.** Combination ac-dc welder, plus an ac power plant, plus 1 KW of dc power while welding, give this model three-in-one versatility. Generator rated at 10 KW of 115/230v, single phase, 60 cycle ac. Welding ranges in amperes are: (dc) 75-175 or 125-350; (ac) 65-160 or 110-400. Rated output at 100% duty cycle: 250 amps dc at 40 volts and 300 amps ac at 40 volts.

**D-250 ROUSTABOUT** provides a two-in-one arrangement whereby either of two dc welding current ranges — 75-175 amps or 125-350 amps — and 1 KW of 115v dc auxiliary power are available simultaneously. Rated output is 250 amps at 40 volts, 100% duty cycle. Generator produces 10 KW of 115/230v, single phase, 60 cycle ac.

All models offered with skids or trailers. Complete specifications and prices sent promptly.

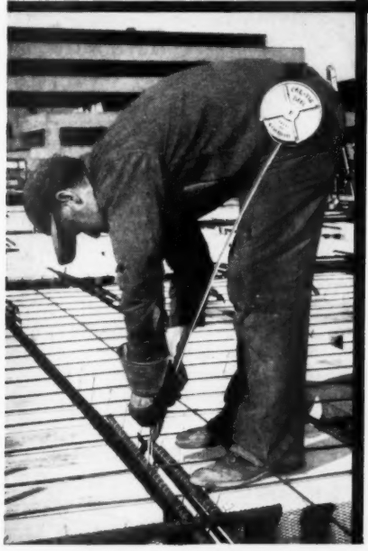
**miller** ELECTRIC MANUFACTURING COMPANY, INC.

Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal • APPLETON, WISCONSIN

For more facts, use Request Card at page 18 and circle No. 346



**HOW TO "BELT" TIE-WIRE PROBLEMS**



When workers use CF&I Annealed Cal-Tie Wire in the handy, belt-borne dispenser, the weight and worry of clumsy shoulder coils is eliminated. There are no loose wire ends—hence no danger of facial scratches or costly eye injuries.

With this modern method of carrying re-bar tie wire, both hands are free—wire can't kink, tangle or catch on protruding objects, thus work in close quarters is easy and safe.

Your workers will like the convenience and safety of Cal-Tie Wire and you will appreciate its efficiency and economy. Cal-Tie Wire Coils weigh approximately four pounds and the wire is available in 14 through 20 gage. Why not get full details now from the nearest sales office listed below.

**CF&I® CAL-TIE® WIRE**

**THE COLORADO FUEL AND IRON CORPORATION** 5290

**THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita
**WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York Philadelphia • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg

For more facts, use Request Card at page 18 and circle No. 347

Before the paving train comes along, a Ferguson planer, pulled by a Euclid TC-12 push-dozer, grades base material to within ⅛ inch.

Of the two Koehring paving trains on the job, this one on the main runway uses three Koehring 34-E pavers. The other used two pavers. Here, International trucks and a White truck feed the machines.

(*Continued from preceding page*)

spreader mounted on an Allis-Chalmers HD-20 tractor.

To blend the material, and to add water when necessary, the contractor used a Seaman-Andwall Trav-L-Plant. Vibrating rollers were often pulled in tandem to achieve the 100 per cent compaction of the base course. A Cat DW10 tractor pulled two Vibro-Plus Terrapac rollers. The new Lima Roadpackers proved very successful in compacting the base. The two at work for the contractor were particularly good at compacting the top lift and occasionally working between the forms. The shoe-type vibrators compressed the top lift without making the surface uneven.

### Paving

Western usually handled the paving in strips from 21 to 25 feet wide for the length of the runway. One paving train with three pavers handled the runway, while another train with two pavers did the work on the aprons and taxiways. An additional Koehring 34-E paver worked on miscellaneous jobs. Counting one spare, the contractor had a total of seven Koehring 34-E pavers on the project.

It took almost three miles of Heltzel reversible steel forms to keep ahead of the pavers. Forms were handled by a Hydrocrane mounted on an International truck and a Hydra-Lift mounted on a Chevrolet truck.

In places where one slab had to be

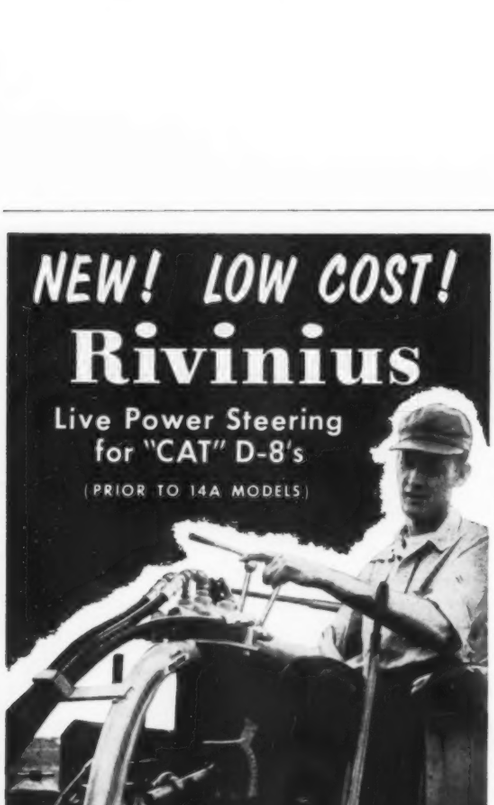
After picking up aggregate at the first double set of batch plants, the batch truck stops at one of the two Johnson 600-barrel cement plants. Each plant delivers two batches simultaneously in two seconds.


NEW! LOW COST!

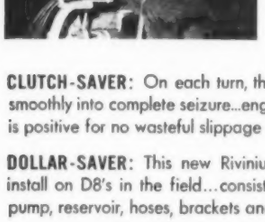
Rivinius

Live Power Steering for "CAT" D-8's

(PRIOR TO 14A MODELS)



**TIME-SAVER:** Operators report they can operate D8's one, sometimes two speeds faster with hydraulic, fingertip control Rivinius Live Power Steering. Levers move only 1½"; return automatically when released.



**MAN-SAVER:** Operator fatigue goes down... performance goes up! Rivinius Live Power Steering provides closer, faster control of D8 power and maneuverability.

**CLUTCH-SAVER:** On each turn, the D8's clutches are engaged smoothly into complete seizure...engagement and disengagement is positive for no wasteful slippage and clutch wear.

**DOLLAR-SAVER:** This new Rivinius system is compact, easy to install on D8's in the field...consists of hydraulic cylinder, valve, pump, reservoir, hoses, brackets and hardware.

*SEE YOUR CATERPILLAR DEALER NOW OR WRITE*

**Rivinius, inc.**

EUREKA, ILLINOIS

For more facts, circle No. 348



*Speed Up Construction!*

FARRELL-CHEEK BAR CUTTERS and BENDERS

- FAST
- CONVENIENT
- ONE-MAN OPERATION

SENIOR MODEL BAR CUTTER

ASSEMBLED FROM F 85 ALLOY AND CARBON ELECTRIC FURNACE STEEL CASTINGS

JUNIOR MODEL

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doweled into another, an ingenious system was used in placing the dowel bars. A cylindrical hole, which later received the dowel bar, was cast into the side of the concrete. The hole was made by a round steel bar bolted to the forms. The steel bar was removed along with the forms, leaving a 2-inch hole in the side of the slab.

Before the adjacent slab was poured, the greased end of a dowel rod was inserted into the hole. The system proved useful because it simplified the forming and did away with dowel bars sticking out in the way of men and machinery.

The three pavers in the larger of the two paving trains received batches from International and White tandem-axle dump trucks. Each truck carried 4 batches, with the cement in a closed container.

The paving train was headed by a Blaw-Knox spreader with Viber vibrators mounted on the rear. Following the spreader was a Jaeger-Lakewood finisher, a Koehring longitudinal float, a Flex-Plane belt machine, and a Flex-Plane automatic spray for applying the curing compound. Working one 11-hour shift, the paving train ran through about 3,000 cubic yards of concrete.

Contraction joints were sawed at 25-foot intervals by Clipper and Champion concrete saws. Mastic was used to fill the joints.

#### Batch plant

Production of 5,000 cubic yards of concrete in 11 hours required a big and efficient batch setup. To handle the job, Western set up three double batch plants. The first, capable of handling two trucks at a time, discharged two sizes of aggregates. The second plant handled the cement; the third, sand. The new Johnson plants were equipped with fully automatic controls, and the weights of the individual batches were automatically recorded.

The two sizes of aggregate were hauled in by rail from Detroit Lakes, Minn., and stockpiled by a conveyor system near the plant. The aggregate was fed from a recovery tunnel to the double batch plant by means of an overhead conveyor. The entire conveyor system was controlled by one man at the plant.

When two trucks rolled in under the plant, each received two aggregate batches, simultaneously. Each truck then moved ahead slightly to pick up another two batches to complete its load.

After the trucks received the aggregate, they moved several hundred feet down the line to one of two cement plants. The identical Johnson plants were equipped with 600-barrel overhead silos, which were stocked from cement cars on an adjacent siding. Each plant discharged two batches simultaneously.

The last stop for the trucks was a double sand batcher, which was similar to the aggregate setup. Generally, only one of the batchers was in operation, for it could keep up with the traffic going through the 3-stop plant. Sand was obtained locally and hauled in by truck.

The non-reinforced concrete for the airfield paving contained 5.9 sacks of cement per cubic yard, with an air-entraining agent producing 4½ per cent of air by volume. The concrete was tested at 14 days for a minimum flexural strength of 570 pounds.

#### Personnel

Western Contracting Corp. had as its project manager Gene Williams. Jim Keefe was the project engineer.

For the Corps of Engineers, Maj. Milton Stevens is the area engineer, and George Craft is the assistant area engineer. The paving engineer is John Richardson. THE END

An International batch truck roars off after making a last stop to pick up sand. This Johnson setup is similar to the double aggregate batcher, but one plant worked fast enough to keep trucks supplied with sand.


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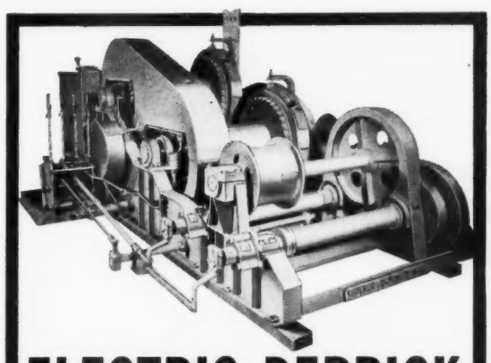

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Management

## Planning and production:

# Factors affecting earthmoving production

by GEORGE E. DEATHERAGE, P. E.
construction consultant

Men and machine charts can be used to check the productivity and efficiency of any man-machine earthwork operation, and from these charts the contractor can determine if he is getting top production.

However, there are many factors that influence earthmoving production, and these should always be taken into account. Dan K. Heiple, formerly associated with R. G. LeTourneau, Inc., outlines them in "Earthmoving—An Art and a Science", which may be purchased for $1 from R. G. LeTourneau, Inc., 2399 S. MacArthur, Longview, Texas.

A number of variable factors—rolling resistance, grade resistance, job efficiency, material weight and swell, rim pull, and tractive efficiency—must be evaluated in estimating production of earthmoving machinery. Of these, the most important is rolling resistance, which is the sum of the external forces opposing motion over level terrain.

It includes the variable effort expanded in the action of tracks or tire sidewalls, the compaction or displacement of the roadway over which the unit travels, and the resistance due to roughness or irregularities in the road. The roadway material and its surface are not as important as the relative firmness and freedom from undulation.

Since flexing of the tire walls must be included as a fixed action, the effort to move a load over a hard, smooth surface can be established as a minimum. All power consumption in excess of that figure will be due to penetration in the travel surface, in its undulation or irregularities, or a combination of these factors.

The value of rolling resistance for a particular surface can be expressed in pounds per gross ton of vehicle weight, and approximate values assigned to common haul road conditions. An average construction road, for example, under big tires at 35 to 50 pounds air pressure, has been evaluated at about 100 pounds per ton of rolling resistance. A 20-ton machine traveling over this type of road would require 20×100, or 2,000 pounds of rim pull to overcome rolling resistance.

Tire size, speed, and inflation pressure affect the rolling resistance for a given road. However, it is possible to assign general values to several types of haul roads. These may have to be adjusted for specific machines.

| Road condition | Resistance |
|---|---|
| Hard, smooth surface | 40* |
| Firm, flexible surface | 65 |
| Average construction road | 100 |
| Soft, rutted dirt road | 150 |
| Deep surface, loose sand | 250 to 400 |

* pounds per ton

Here, rolling resistance is a value assigned to the road. Under normal conditions it is applied against loads carried by tires and to the wheeled unit hauled by a tractor.

### Grade resistance

Grade resistance is the term applied to the opposing force of gravity due to grade. It can be computed by simple laws of mechanics. The resistance varies directly with the angle of grade and weight of the machine, and is 20 pounds per gross ton for each 1 per cent of adverse grade. For a 20-ton unit on a 5 per cent grade, the

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grade resistance would be equal to 20×5×20, or 20,000 pounds. This figure added to the 2,000-pound rolling resistance would give the total resistance of 4,000 pounds to be overcome to negotiate the grade.

Material in place, having weathered and settled, has comparatively few voids or air spaces in it; when it is disturbed, in loading, it acquires voids or swells. Because of this, the actual amount of material in one cubic yard after it has been distributed is not as great as the amount of material in 1 cubic yard in place. Since the pay-yard to the contractor is most always the bank-yard or in-place yard, it is necessary to know the extent of swell in loading to estimate production.

Various materials will stand on different slopes above the side sheets of the scraper or hauling unit. This angle of repose can be coupled with voids to give a single swell factor. Sand generally has a swell factor of 90 per cent; common earth, 80 per cent; clay, 70 per cent; and broken shale or rock, 60 per cent. Sand ordinarily does not acquire 10 per cent voids, but neither will it stand on the 1 to 1 slope on which most heaped scraper capacities are computed. The figure is a compromise.

Multiplying the heaped capacity of a machine by the swell factor gives an approximate pay-yard capacity. A scraper with a heaped capacity of 15 cubic yards in common earth has 80 per cent × 15, or 12 pay-yards nominal maximum.

The weight of material limits speed and gradability with the available horsepower, and in special materials may limit the volume of the load. The approximate weight in pounds per cubic yard of clay and dry gravel is 2,700; loose earth, 2,100; packed earth, 2,500 to 2,700; wet packed earth, 3,000 to 3,100; dry to wet gravel, 3,000 to 3,400; solid shale, 4,500; broken shale, 2,500 to 2,700; broken slag, 2,400; dry to wet sand, 2,200 to 3,300; and loose packed sand and gravel, 2,700 to 3,000.

### Rim pull

Rim pull or track pull is the pulling force that the engine can deliver to the tires or tracks at the point of contact with the ground. To compute rim pull, multiply the torque of the engine by the over-all gear ratio of the driving train, to arrive at the turning force at the axle in foot pounds. This force is divided by the effective lever of the wheel or track sprocket (the rolling radius) in feet. The total is reduced by the mechanical efficiency of the driving train, since some of the torque will be used in turning the gears and bearings.

Substituting more readily available data than torque, gear ratios and rolling radius, and combining numerical constants, results in the formula: rim pull equals horsepower × 375 × efficiency divided by mph. Belt horsepower is used; and efficiency, if unknown, can be estimated at 75 to 85 per cent for various gear trains. The portion of this force that can be actually converted to tractive power is drawbar pull, which brings up the tractive efficiency.

Tractive efficiency is a decimal factor indicating the percentage of the weight on the driving tires or tracks which can be used as pulling or pushing effort. The efficiency or tractive coefficient varies with grouser or tread design, and with the type of material on which the unit is operating.

### Acceleration

Acceleration requires an excess of rim pull for any given condition. If this excess does not exist to overcome the inertia of a machine and its load, the unit will not be able to increase its speed from the low point to high in a given gear.

To compute the forces involved in accelerating a load through several gear changes is rather involved. Experience has shown that if an excess of rim pull in the amount of 20 pounds per ton is available in the top hauling gear, the prime mover will exhibit good performance characteristics. A fixed time of one minute for gear shift and acceleration covers a sufficient range to be considered average, and may be used for estimating purposes.

Actually, each 10-pound-per-ton of

---

*This is the thirty-fifth of a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, Satsuma, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.*

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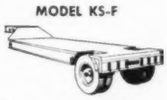
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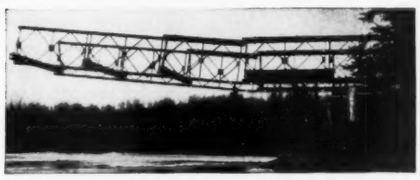
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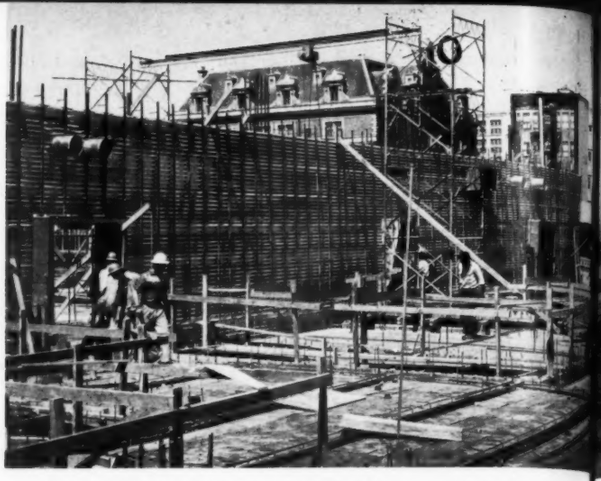
## Construction camera

**Short work** is made of a demolition job on a Peoria, Ill., building by a Lorain 15-ton Moto-Crane equipped with a 65-foot boom and clamshell bucket. N. E. Finch Co., excavating contractor of Peoria, Ill., has the job of clearing the site to make way for new construction.



**Forming for walls** of the California State Building extension, San Francisco, is corrugated Superspan, made by Curoco Mfg. Co. from Bethlehem Pacific steel sheets. The 8-inch air space between walls complicated removal of conventional forms; Superspan will remain in place.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It is this Pressure Metering Master Valve, the "heart" of Rosco Distributors, that gives you this built-in control of pressure which is the only accurate method of obtaining precise bituminous application. This is the valve that also directs the flow of material for all of the Rosco Distributor functions.

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(*Continued from preceding page*)

excess rim pull gives an approximate acceleration of 0.1 mph per second. In lower gears, where the excess may run to 100 pounds per ton, a given machine might accelerate to 10 mph in 10 seconds. On the other hand, with only a 20-pound-per-ton excess, it would take about 50 seconds to go from 20 to 30 mph.

The actual time of acceleration in high-speed hauling may run over one minute. However, a machine on such hauls moves a considerable distance while accelerating. If no allowance is made for this travel, and the unit is figured to have covered the total haul distance at the average hauling speed, the two will tend to balance out, and the one-minute allowance may be used rather than computing acceleration separately.

### Production estimates

Depending on the degree of accuracy required, production estimates for heavy equipment can be made by several methods—direct computation, tabular method, slide-rule method, and "guesstimating".

The direct method of computation is the most accurate. Each of the factors affecting production is evaluated to determine the pay yards or tons contained in the land and the number of loads per hour equipment can handle.

To arrive at pay-yard per load, it is necessary to reduce the heaped capacity of the unit by the swell factor for the material being handled. A 20-cubic-yard scraper working in clay—which has a factor of 70 per cent—carries about 14 pay-yards per load. This figure assumes that sufficient power is available to load the scraper full. If this power does not exist, it will be necessary to reduce the load. Under most conditions, one pound of drawbar pull per pound of material to be loaded is more than sufficient to accomplish loading in one minute or less.

Gravity pull on favorable grades supplies 20 pounds of drawbar pull per gross ton of equipment for each 1 per cent of grade to assist loading or pulling power. Similarly, grade resistance on adverse grades will subtract, in like amount, from drawbar


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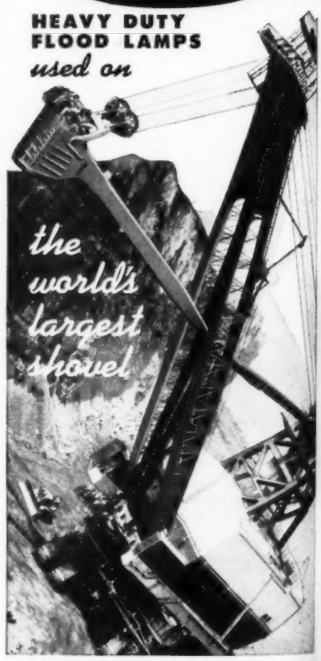

Whether it's this colossal Marion shovel with a 70 cu. yard bite, or medium size or small machines, STURDILITES are providing better light, longer lamp life, at lower cost, for users of all types of mobile mining and construction equipment.

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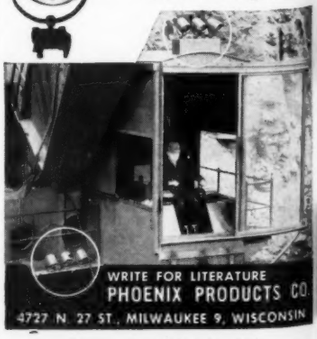

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**Gritty sand fill** is dozed into place by a Michigan Model 380 for the expansion of Oakland International Airport in California. Utah Construction Co., San Francisco, contractor on the $17 million project, brought in the rubber-tire dozer when sand and salt water ate away track rail and rollers of crawler tractors.

**Getting ready to start work** on a U. S. Army Corps of Engineers project in the Great Lakes is the dredge, Rock Island. The dredge is self-propelled by two 650-hp propulsion engines, is equipped with a 1,000-hp pumping engine, and is capable of removing 12,000 cubic yards of material per hour.


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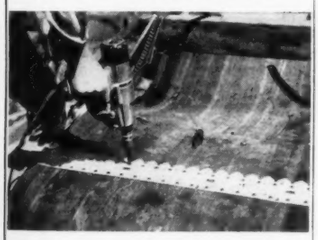
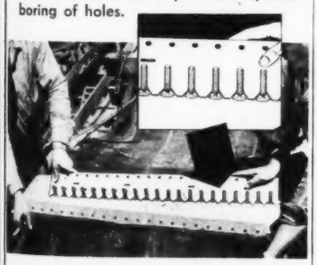
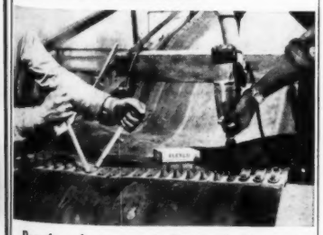


The FLEXCO Power Tool Boring Bit used with electric or air impact tool speeds boring of holes.



New FLEXCO Templet positions bolts for quick joining of belts. Reaching under belt has been eliminated.



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pull. Loading on a 10 per cent favorable grade, for example, 50 tons of prime mover, scraper, push-tractor, and load have a gain of 20×10×50, or 10,000 pounds of drawbar pull.

The number of loads delivered hourly to the fill depends on the job efficiency, the load time, spread or dump time, and the travel time.

Load, dump, turns, and acceleration are considered as a unit because they are relatively unaffected by length of haul and grades and are called "fixed time". For a sufficiently powered scraper unit, the approximate time consumed by each of these maneuvers is:

| | Minutes |
|---|---|
| Loading | 1.0 to 1.5 |
| Spreading or dumping | 0.5 |
| Two turns | 0.5 |
| Shifting, acceleration | 1.5 to 1.0 |
| Total fixed time | 1.5 to 3.5 |

Shovel loading of haul units depends basically on the size of the loading shovel and the degree of the swing. Computation of travel time requires knowledge of the speeds, power, weight of the equipment with its load, grades, condition of roadway, and length of haul.

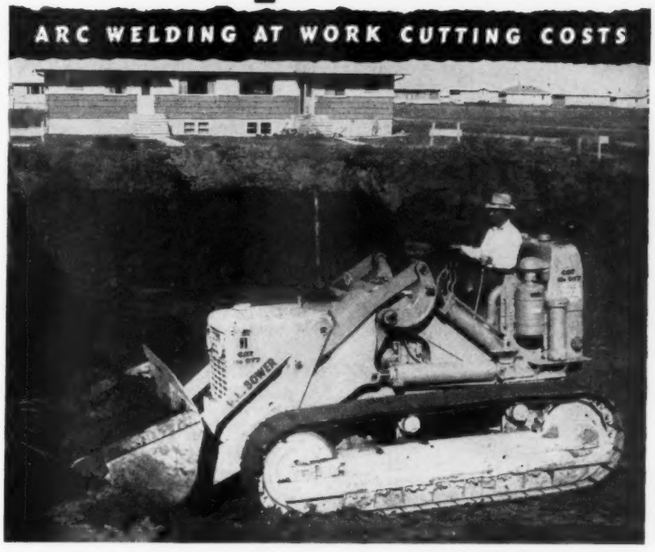
To determine the speed of travel, the power available and need to haul must be known. Roadway surfaces and grades are the power-consuming factors. If rim pull is not available, but the horsepower and speed are known, it may be reasonably estimated by the formula: rim pull equals 375 × horsepower × efficiency divided by speed in mph. Efficiency in most two-wheel prime movers is about 85 per cent. Rim pull in all gears for a 186-hp unit at each speed would be: first gear equals 375×186×85 per cent equals 17,400 pounds divided by 3.41 mph. For second gear (7.25 mph) it would be 8,200 pounds; third gear (12.63 mph), 4,700; fourth gear (22.28 mph), 2,660; and fifth gear (35.03 mph), 1,695.

Lugging of the engine in all gears will increase rim pull for that gear, but at a lower speed than the indicated governed speed. The ability to lug will keep the machine in the higher gear in marginal cases. In low gear, this figure may exceed the maximum usable rim pull of the machine, limited by tractive efficiency. Any

*(Continued on next page)*


Weldynamics

ARC WELDING AT WORK CUTTING COSTS



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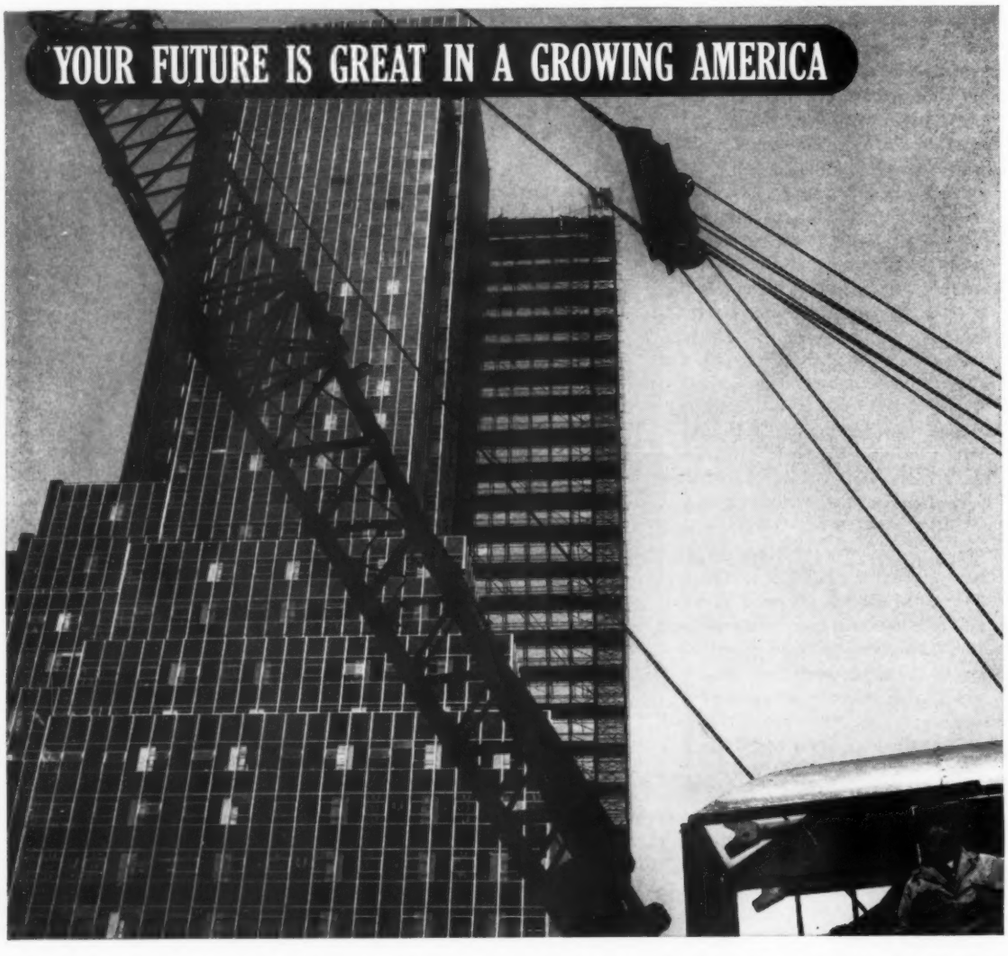
## Construction camera

**Work is done in the dry** on the foundation for a new Sears Roebuck building in Jacksonville, Fla., as a Griffin Wellpoint system eliminates the 14 feet of ground water. Batson-Cook Co., Inc., also of Jacksonville, is the general contractor on the $14 million project.

**A 40-ton oil storage tank "walks"** to its new site with the help of a Manitowoc crane. This was the first time a crane was used to transfer a medium-size tank at the Baton Rouge, La., refinery of Esso Standard Oil Co. Wood mats keep the crane from sinking into the soft earth.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*(Continued from preceding page)*

power in excess of maximum usable rim pull only spins the wheels.

### Estimating costs

To complete the estimate down to cost per cubic yard, the ownership and operating costs of a scraper must be known or also estimated. The list price added to the freight price gives the delivered price; and the retail tire replacement cost deducted from the delivered price gives the delivered price, less tires. This is divided by the estimated hours of useful life to provide an hourly cost of the machine. The addition of the depreciation (straight line, less tires) and interest, insurance, and taxes gives the total ownership cost per hour.

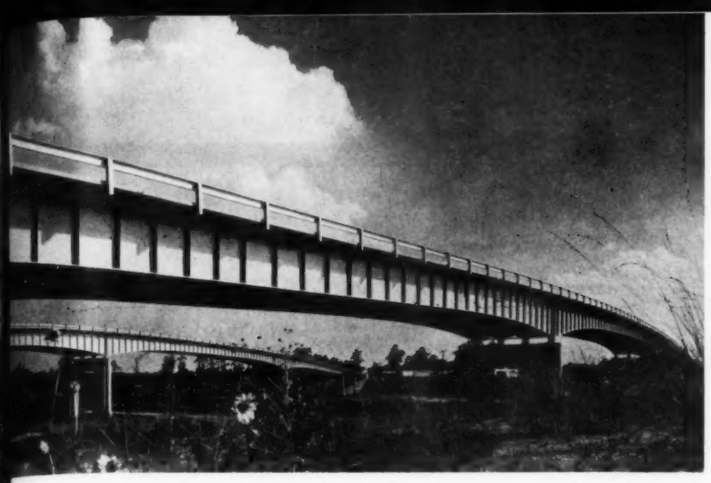
The hourly operating costs are a total of the operator's wages, fuel, lubrication, maintenance and repair, blades and cable, and tires per hour. This total, added to the total ownership costs per hour, gives the total hourly ownership and operating costs. To arrive at the cost per cubic yard, divide the hourly production of one unit into the hourly ownership and operating cost. Costs for the push-tractor are then added.

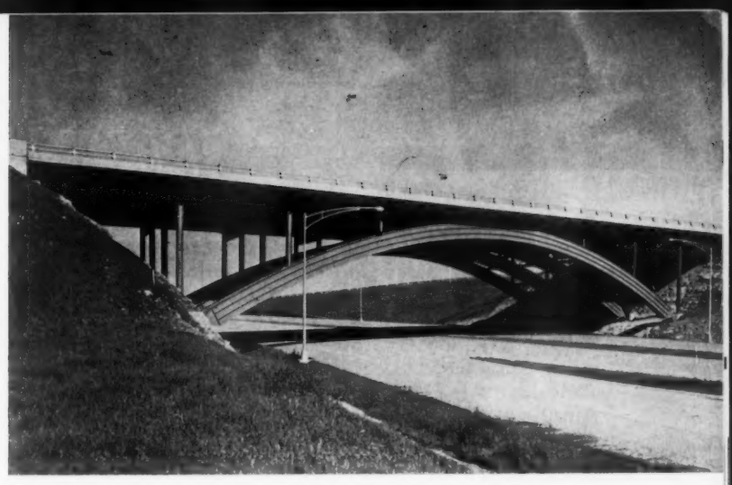
### Push-tractor, scraper costs

The pusher cycle of operations starts with the beginning of one load and ends with the beginning of the next, and includes both loading and maneuvering. The average time consumed is about 2 minutes per cycle, but this can be reduced to 1.5 minutes by proper loading methods and fast pushers. Of this time, one minute is required to load in about 100 feet and 0.5 minute to position behind the next scraper.

The number of scrapers any one pusher will handle is determined by the complete cycle time of the scraper in minutes divided by the cycle time of the pusher in minutes. On a typical haul, the maximum number of scrapers a pusher can handle with a 1.5-minute cycle might be 6.88. This is divided by the 1.5-minute cycle to give the answer: 4.6 scrapers. Use of 5 scrapers would mean a short scraper wait; use of four, a short pusher wait.

Estimated costs per hour of owning and operating the pusher are com-





**The first award** in The James F. Lincoln Arc Welding Foundation welded-bridge design competition went to Farland C. Bundy and Charles S. Matlock for the **Buffalo Bayou Bridge** in Houston, Texas. These engineers in the Bridge Division of the Texas State Highway Department designed the twin-span 668-foot, all-welded continuous plate girder bridge. One of the two second awards went to a team of Texas Turnpike engineers—Joe C. Bridgefarmer, Douglas A. Nettleton, and William L. Powell—for a **Dallas-Fort Worth Turnpike bridge**, a 192-foot span of four welded box-girder arch ribs. (See story on page 36)

puted in the same manner as for the scraper, but in the case just cited, the hourly cost of the pushers must be pro-rated to four scrapers. The pusher cost per scraper is divided by 4, to provide hourly cost. The hourly scraper production for one unit is then divided into the pusher cost per one scraper. This gives the pushing cost per yard. The hourly scraper production for one unit is divided into the hourly ownership and operating cost to give the scraper cost per cubic yard. The total cost per cubic yard is achieved by adding the pushing and scraper costs per cubic yard.

#### Costs with hauling units

Unit production and costs of hauling units are figured and estimated in practically the same manner as scraper production and costs. The only difference is that the loading unit or excavator has a direct bearing upon the production obtained and the resulting costs.

The swell factor of materials can be generally disregarded if the rated capacity of the dipper is used. The heap of material in the dipper should take care of the swell. Production will vary with the amount of power available and the ease of loading the material.

Yardage or tonnage costs of hauling units are computed in the same manner as for scrapers. The cost of the excavator is not to be included or pro-rated over the haul fleet. Costs for hauling units are often figured on the ton-mile basis: ton-mile cost equals the cost per ton divided by the one-way haul distance in miles.

The variety of bulldozer uses makes accurate estimating almost impossible. A few operations, such as working a high wall, backfilling, stockpiling, or feeding traps and grizzlies, can be analyzed. The dozer cycle on such work includes two reversals of direction, a loaded haul, and backing operation. There is no standard method for arriving at blade capacity. But it is approximated by the volume enclosed by a 1 to 1 slope from the top of the blade to the ground in front and a vertical plane at each end.

#### Other computing methods

The tabular method of computation involves the use of tabular information from previous jobs of similar nature, or production charts in manufacturers' literature for a given piece of equipment. However, each project contains variables affecting production which seldom duplicate the conditions from previous jobs or those assumed for specification sheets.

The slide-rule method, utilizing the principles used in direct computation, involves the use of manufacturers' earthmoving calculators. They will simplify some of the paper work, but their value can be overestimated. If used with specific job data, they will give results that are no more accurate than the factors supplied.

Simple jobs or small portions of the more complex ones can also be roughed out by a short cut on direct computation. In the short-cut or "guesstimating" system, which is basically a mental process, some of the variables are eliminated since they cancel each other. Earthwork to be done is roughly approximated with this method, and a great deal depends upon individual judgment. But for bid work, this approach is extremely hazardous.

After working with a particular unit for extended periods, some contractors can use their judgment and be surprisingly correct in their "guesstimating". Many a contractor owes his success to just such an uncanny ability and perhaps does no conscious mental arithmetic before reaching the final figure. Generally speaking, this method is useful insofar as it gives a rough, on-the-spot picture and does it fast. Used for more than this, it is an invitation to bankruptcy.

*(Next month's article will deal with "Planning and production: Job-site equipment".)*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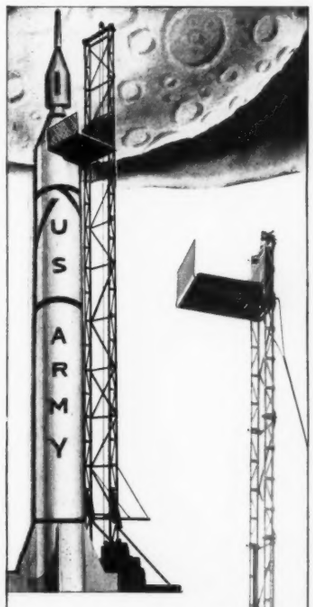


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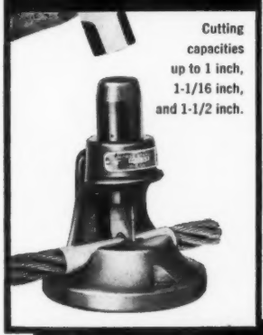

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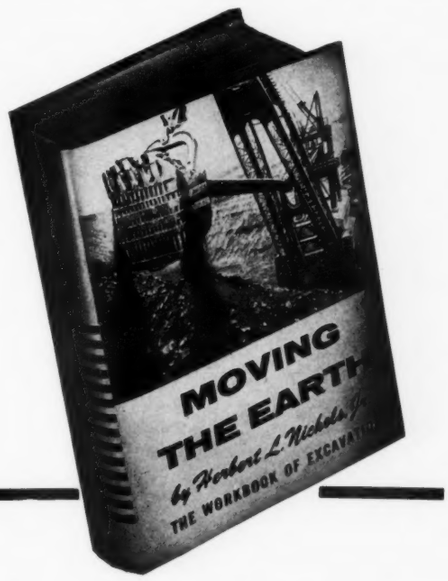


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## Surveying washington

### *Highway spending to hit $8.1 billion by 1962*

Taking a look ahead, the Bureau of Public Roads forecasts that highway spending by all units of government—federal, state and local—will reach $8.1 billion yearly in 1962. This compares with 1957 capital expenditures of $5.7 billion.

The predicted upswing is expected to be relatively even in tempo. Federal roadmen feel that total spending this year will hit $6.2 billion, a jump of 10 per cent. The 1959 figure is placed at $7.1, in 1960 it will be $7.3, and in 1961 the total will reach $7.7.

Expenditures for construction in 1962 will represent $6.9 billion, or 85 per cent of the $8.1 billion total. The remaining spending will go for preliminary engineering and right-of-way acquisition.

As would be expected, federal-aid funds will account for a growing share of the spending totals, from 29 per cent this year to 42 per cent when the program hits its peak.

State highway expenditures, according to BPR, will increase from the present $2.6 billion annual rate to $3.1 in 1962. Around two-thirds of the '62 total will be funds for free roads that do not come under federal aid. The rest will be money matching Uncle Sam's help.

Local government spending on roads will increase modestly from $1.1 to $1.3 billion in the 1958–62 period.

One area of highway construction that will get a dwindling rather than expanding dollar amount, the bureau says, is toll facilities. Annual outlays for pay-highways already have been sliced in half, from nearly $1 billion in 1955–57 to an expected $500 million this year. In 1962, toll facilities will get but $75 million in funds.

### *Record looks good on bills involving construction*

The past Congress was one of the biggest spenders, with actions taken on many measures of interest to construction. Outlays would have been even higher if there had not been a change in business conditions.

Early in the year, the lawmakers were enthusiastically endorsing many so-called "anti-recession" measures, which ran into trouble later on when the recession bottomed out and economic recovery began. Some of the measures were voted down in Congress on the strength of second thoughts, and others met vetoes at the White House as concern again turned to the long-range problem of inflation.

Here are some of the legislative high lights of 1958:

**Highways**—The biggest news was the enactment of a bill stepping up construction authorizations for the Interstate System, temporarily suspending pay-as-you-go financing, and providing for unprecedented billboard regulation.

Also passed were other bills involving roads. One requires the Secretary of Commerce to come up next year with suggested legislation to assist Congress in deciding whether states should be reimbursed for existing roads incorporated into the Interstate System. Another bill allows states seven years to acquire right-of-ways for federal-aid highways before construction must begin. Also passed were bills to revise and codify the federal-aid highway laws into a single package; to extend until January, 1961, the final report of the highway cost allocation study to determine maximum desirable vehicle dimensions and weights; and to use this year's revised cost estimates for completing the Interstate System as a basis for apportioning funds in fiscal 1961.

**Rivers and Harbors**—After vetoing its predecessor, the President signed a revised $1.5 billion measure for about 137 new projects and river-basin development. Also going through was a public works appropriation bill of $1.1 billion for fiscal 1959, including money for some 400 water projects to be handled by the U. S. Army Corps of Engineers and the Bureau of Reclamation.

**Schools**—Against administration recommendations, Congress passed legislation extending the program of federal aid for school building in areas "impacted" by federal installations. Some phases of the program are made permanent. President Eisenhower signed the bill reluctantly.

Congress beat back all attempts, most of them half-hearted, to obtain an omnibus school construction bill, and passed instead a measure providing federal loans to students and for equipment buying. The bill is aimed at spurring the teaching of science, mathematics, and languages.

**Airport construction**—A bill ex-

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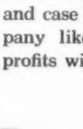

**MOTOROLA** *PRIVATE-LINE 2-WAY RADIO*

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tending the program of government aid for jet-age airport building, and increasing funds for the purpose from $63 to $100 million annually, ran into a White House veto. The President indicated it was time Uncle Sam got out of this area and said that next year he would ask that the program be curtailed sharply. Aid will end next June 30, unless it is extended by Congress.

**Local Public Works** — The so-called "community facilities" bill got the ax in the House after moving through the Senate. Designed as an anti-recession measure, it would have greatly increased federal loan authorizations for state and municipal public works.

After this bill failed, Congress passed a "depressed areas" measure, providing $275 million in loans and grants for industrial development and public works. But this substitute also ran into a White House veto.

**Measures shelved or voted down** included the bill amending federal construction contract procedures to prevent bid shopping and peddling. The bill, which must be re-introduced next year, stipulated that a general contractor bidding for a federal lump-sum award over $100,000 must list in his prime bid the names of the mechanical specialty contractors he will hire. A 5-day period of grace for substitutions after the bid opening would have been permitted.

The bill, which passed the House in 1957, never reached a Senate vote, although attempts were made to bring it up late in the session.

Failing of enactment for various reasons were other bills. One was a big reclamation bill (Fryingpan-Arkansas) authorizing the building of a tunnel through the Continental Divide to transport water from the Fryingpan River on the western side to the upper Arkansas River Valley in Colorado. (The battle of Hell's Canyon was resolved in 1957.) Two other bills round out the list: the bill giving the Tennessee Valley Authority the power to issue revenue bonds for financing construction of additional plants, and an omnibus housing bill that included $400 million for a one-year program of slum clearance and urban renewal.

**A definite compromise** was the bill to make federal-aid highway apportionments for fiscal 1961 on the basis of the revised cost estimates. The House had passed legislation extending the basis through fiscal '62, but Sen. Albert Gore (D., Tenn.) refused to go along with a two-year extension. The roads subcommittee chairman said he wanted to review the whole question of cost-estimate procedures because of the dispute between the General Accounting Office and BPR. After a study, the GAO concluded that geometric design standards are not sufficiently definitive to permit the states to apply them uniformly in arriving at construction cost estimates. The chief criticism was that there is no specification of maximum design standards, but just minimum design standards, to guide the states. The BPR countered that the standards are fair and can be applied uniformly throughout the states without trouble.

In testimony before Sen. Gore, Secretary of Commerce Sinclair Weeks said the BPR had re-examined the standards because of the criticism and had again concluded they are "sound" and that the state estimates are "reasonable".

Weeks pointed out that none of the highway design standards adopted since 1941 has included "maximum dimensional values".

He expressed fear that imposing maximum fixed standards "would impede progress in the development of new and improved highway facilities to meet ever-increasing needs. Through fixed standards, the federal government could hamper and deter state highway departments in evolving new designs and new highway structures which may be safer, more suited to traffic needs, more economical, and more efficient. Fixed maximum standards suggest rigid, inflexible obstructions to progress and development in highway design and construction."

But Sen. Gore remained unconvinced. He still wanted another look at the question next year.


LOOK AT THE No. 977 LOAD OVER 18 TONS IN 4 MINUTES— ALL DAY LONG!

This is a road construction job between Durham and Chapel Hill, N. C. Loading sand for Nello L. Teer Co. is this Caterpillar No. 977 Traxcavator, averaging 18.4 tons per load. Its load time per truck is 4 minutes, timed right on the job. Supt. R. G. Moore states flatly: "Best truck loader there is."

A few reasons: the No. 977's track roller frames are extended for better stability; its 2¼ cu. yd. bucket tilts back 40 degrees at ground level, giving leverage at the cutting edge and preventing spillage; operator sits high and comfortable, out of the dust, with all controls conveniently at hand.

New with the No. 977: a Side Dump Bucket attachment (2¼ cu. yd.) that dumps to the left as well as forward and is directly interchangeable (same pins, bolts, nuts) with the standard bucket.

But don't just look at pictures—look at the dirt fly on your own job when a Cat No. 977 Traxcavator digs in. Call your Caterpillar Dealer right now and set up an eye-opening, truck-filling demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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FOR FAST LOADING

LOOK FOR YOUR CATERPILLAR DEALER IN THE YELLOW PAGES

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*No time required for set-up*

# Crane lays 80″ pipe without outriggers

This 25 ton Michigan Truck Crane, with 55 ft of boom, has laid 80-inch reinforced concrete sewer pipe in a built-up residential area at the rate of 200 lineal feet per 8-hour day.

Its output on 72-inch pipe has gone as high as 550 lineal feet per day. Pipe sections in both cases measured 4 ft in length, 4½ to 5½ tons in weight.

Production like this has made the Michigan owner, P & E Construction Company, San Jose, California, one of the biggest, busiest underground contractors in the Santa Clara Valley. Selection of *the best equipment they can find* has helped them to success in only six years of operation. A case in point:

One of P & E's three Michigan Tractor Shovels (a 2 yard, 106 hp Model 125A) speeds backfilling and cleanup around storm drain.

## "Three good Michigans lead to another"

P & E has three Michigan Tractor *Shovels*. In several years on the job, they'd proved an excellent investment. So when the time came to buy a new *Crane*, what could be more logical than taking a look at Michigan? What they saw *sold* P & E. They chose a Model T-24 Truck Crane. After a season, owners report, "It's done even better than expected—we couldn't be more pleased!"

## Stability superior, even without outriggers

It's often necessary to flatten the boom in setting pipe—but who wants to fiddle with outriggers on a high-speed job like this? Note on-the-job photo, which shows the Model T-24 laying 72-inch pipe *without outriggers*. Partners Ernest Pestana and William Ebert regard this as "the acid test" of Michigan's stability . . . and credit work without outriggers as a "major reason" for Michigan's ability to increase production.

## Travels at high speeds, on or off the highway

Much of P & E's work is off-the-road, in soft earth, where the Michigan's 6x6 drive and planetary-wheel axles are essential. The machine strips for highway travel in minutes, runs at normal traffic speeds from job to job. Two crawler-type cranes, still in use by P & E, have been "retired" by this Michigan mobility to what Partner William Ebert calls "more limited, specialized" tasks.

## Mobile, versatile Michigan easy to maintain

Other jobs in which the Model T-24 excels: Pouring concrete culverts. Setting steel slip forms. Cleaning ditches with dragline bucket. Excellent accessibility makes maintenance easy, prevents serious problems from arising.

If this kind of dependability and performance appeals to *you*, take a tip from this contractor . . . contact *your* Michigan Distributor. He'll be glad to demonstrate a 10, 15, or 25 ton Michigan, so you can judge its capabilities first-hand.

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**CLARK EQUIPMENT COMPANY**
**Construction Machinery Division**
**2407 Pipestone Road**
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